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FORMERLY The BULLETIN

THE STATUS OF RENAL PHARMACOLOGY

TES-TAPE®... helps detect the pregnant "pre-diabetic"

". . . fetal mortality in the unrecognized diabetic may be as great as, if not greater than, in the known diabetic."[1] Therefore, it is vital to find the "pre-diabetics" by frequent blood and urine testing.

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1. Shlevin, E. L.: Pregnancy and Diabetes, Diabetes, *6*:523, 1957.
2. Wilkerson, H. L. C.: *Ibid.*
3. Whitehouse, F. W., *et al.*: Management of the Pregnant Diabetic, M. Times, *86*:833, 1958.

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Dear Sirs:

Schering Comments on Hahnemann Case

DEAR HOSPITAL PHARMACIST: Although considerable time has passed since the "Philadelphia incident" mentioned by AMERICAN SOCIETY OF HOSPITAL PHARMACISTS' President Bogash in both the January and February issues of AMERICAN JOURNAL OF HOSPITAL PHARMACY, we hear an occasional report which indicates to us that the facts are still not sufficiently clear. Therefore, we would like to take this opportunity to write to our associates—fellow members of the ASHP—and tell our story about what happened in Philadelphia last year.

The facts are: Our hospital representative was *asked* to stop in at the office of one of the staff physicians at Hahnemann Hospital who had a complaint about the *quality* of a Schering product. The package containing the product was labeled "METICORTEN" and upon examination and investigation, the product proved *not* to be METICORTEN but the chemical equivalent manufactured by another drug company. At about the same time, our hospital representative also talked with a graduate student in the same hospital who had a "METICORTEN" prescription filled in the hospital pharmacy. Here again, the product dispensed was not METICORTEN. In both instances, the Schering trademark "METICORTEN" was typed on the prescription package label.

Two members of the Schering staff then visited the Hospital Pharmacy with the intention of discussing this problem of filling prescriptions with a competitor's product, and marking it "METICORTEN," hoping to correct it immediately.When the Hospital Pharmacist took his firm stand on the "Hospital Formulary" platform, the Schering representatives asked the Pharmacist if he would allow the matter to be brought up before the membership of the Philadelphia Chapter of ASHP (of which group this Pharmacist was currently president) for informal discussion—with no names or places mentioned. This request was vigorously denied.

The Schering representatives, after informing the Pharmacist of their proposed action, then discussed the matter with the Hospital Administrator. Although there was a better understanding in this interview, no corrective action was taken. Thereafter, the Schering representatives contacted the Pennsylvania State Board of Pharmacy which resulted in official citation of the Pharmacist before the Board of Pharmacy.

The case was subsequently heard before this official body in Harrisburg, Pennsylvania. To date no decision has been rendered. In order that we may clear up a few misunderstandings, we would like to emphasize these points:

1. Schering did not release the erroneous story concerning this matter to the press, and as a policy will not discuss pharmacy problems in lay publications.

2. Schering is not opposed to the Formulary System when properly used, and not abused.

3. Schering will be only too happy to resolve any problem or misunderstanding with (a) the individual concerned, and/or (b) his professional organization—if this organization has a grievance committee which is empowered and inclined to take effective action.

GEORGE C. STRAAYER, *Director of Professional and Trade Relations*

Dated: May 27, 1959
Schering Corporation
Bloomfield, New Jersey

From Switzerland

DEAR SIRS: I was very happy to receive a copy of the American Hospital Formulary Service and have looked at it with much interest. Also, we have occasion to refer to it . . . Will you please give my felicitations to the group responsible for publishing the Formulary . . .

R. FREUDWEILER, *Director of Pharmacy*
Cantonal Hospital
Lausanne, Switzerland

Reprint Requested

DEAR SIRS: May I have a reprint of your editorial entitled, "Outpatient Prescriptions and Hospital Pharmacies," which appeared in the April issue of the AMERICAN JOURNAL OF HOSPITAL PHARMACY?

You are again to be congratulated for a very timely editorial. It might be a good idea to have this question debated at the Cincinnati meeting. . . .

EDWARD F. CROUMEY, *Chief Pharmacist*
The Mary Fletcher Hospital
Burlington, Vermont

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editorial

by DON E. FRANCKE

Pennsylvania Board Ruling Appealed

► THE PENNSYLVANIA BOARD OF PHARMACY recently moved to suspend for 90 days the license of the Chief Pharmacist of Hahnemann Hospital in Philadelphia for alleged substitution. Responding to this action, attorneys filed an appeal on behalf of the Chief Pharmacist in the State Court. By this step the attorneys received a supersedeas of the appeal over the adjudication and order of the Board of Pharmacy.

The charge of substitution was lodged with the Board of Pharmacy by representatives of Schering Corporation who alleged that when their brand of prednisone was prescribed, a product made by another manufacturer was dispensed in two instances. (See page 323 for a statement by a representative of Schering Corporation and page 347 for the legal brief filed on behalf of the Chief Pharmacist of Hahnemann Hospital.)

One case of alleged substitution involved a physician who came to the Pharmacy to borrow the drug for his own personal use, while the other case involved a prescription for Meticorten written by the physician in charge of the student health facilities at Hahnemann Hospital for a graduate student. In each instance the physician stated that he understood that drugs were dispensed under the formulary system and that prescriptions written by him for a trade name drug might be filled with the same chemical product made by a different manufacturer.

It appears that the point at issue in this case is: What constitutes "the consent of the prescriber?" Does it include prior blanket authorization by the medical staff for the pharmacist employed by the hospital to dispense a drug under a nonproprietary or another trade marked name when a different brand is prescribed? The Pennsylvania Board of Pharmacy has taken the position that such blanket authorization is not legal. However, attorneys for the Chief Pharmacist argue that the Pennsylvania law does not require a new, specific consent of the physician for each individual prescription and that, in fact, the law requires only a general consent of the prescriber. Futhermore, it is argued that if the Pennsylvania Board of Pharmacy places a construction on the pharmacy law which would require a pharmacist to obtain a new or specific consent for each prescription written, such a construction of the act by the Board of Pharmacy would itself be erroneous, invalid, and unlawful.

In 1957 a Special Committee of the ASHP issued a statement on the "Formulary System and Alleged Substitution" *(Bull. Am. Soc. Hosp. Pharm. 14*:691 Nov.-Dec. 1957). The position taken by this Special Committee was as follows:

"1. The Chief Pharmacist in his role as Secretary of the Pharmacy and Therapeutics Committee has a formal, organizational relationship with the medical staff which does not exist in other areas of pharmacy practice.

"2. The policies involved in accepting and dispensing drugs are under the control of the medical staff.

"3. A policy to accept and dispense drugs under their generic names is approved by the medical staff.

"4. This policy is similar to that used by the *Pharmacopeia of the United States* and the *National Formulary,* as far as the acceptance of drugs is concerned.

"5. All members of the medical staff are informed of the policy.

"6. No deception is involved.

"7. By approval of a policy to accept and dispense drugs under generic names, the medical staff gives their express approval to this method, and

"8. Under such conditions substitution is not involved in the operation of the formulary system."

This position is a sound one and we believe it will be upheld by the courts.

Certainly the Court's decision in the Hahnemann case will have far-reaching effects. It may be, in effect, a test case which will establish precedent for the interpretation of similar laws in other states.

by RALPH W. MORRIS

► BEFORE REVIEWING RENAL PHARMACOLOGY, I would like to briefly touch on two current aspects of pharmacology. First, why is pharmacology such a "big seller" today? Perhaps pharmacology is a "big seller" because the science is new, the drugs new and the pharmacist, relatively speaking of course, not so new. Thirty-four percent of the registered pharmacists in the United States have had less than four years of collegiate pharmaceutical training. This figure includes 13 percent who have had no college training at all. In the light of the scope of modern pharmacy, is it any wonder that the position of the pharmacist which is intermediate between the health conscious laiety and the pharmacologically poorly trained physician, is frequently a very demanding one, especially to the poorly trained pharmacist? Yet the pharmacist is the only member of the health team who has had extensive experience, academic and practical, with every aspect of drugs. It is reasonable then to expect that the populace, professional and lay, should turn to you, the pharmacist, for professional advice on drugs. With societies current importance on "doing" it is not too difficult to understand why so many questions are directed at the pharmacist as to what a drug does as a therapeutic or toxic agent.

There are at most 1000 pharmacologists in this country who have received professional training leading to a doctorate in pharmacology. Yet by title there appear to be pharmacologists by the thousands. This is my second question. Why? The answer lies in the advancements made in pharmacology: advancements not in the "tools of the trade" but advancements in the objective to which these "tools" are applied. How then has pharmacology changed since the first professional degree in pharmacology was granted 26 years ago?

Materia Medica versus Pharmacology

Not many years ago materia medica bore the only scientific resemblance to modern pharmacology (see Fig. 1). With the development of industrial, as well as academic, research in pharmacology it became evident that materia medica—the study of the sources, the descriptions and the preparations of drugs—could not be thought of as also including the actions of drugs. Consequently the science of pharmacology evolved, defined then as the study of the actions of drugs on tissues. Generally speaking pharmacology still remains so defined today. More specifically, however, we must now define pharmacology in terms of actions (pharmacodynamic, pharmacotherapeutic, and toxic) and in terms of posology (dose *versus* response). Pharmacodynamics is the study of the actions of drugs on *normal* living tissues, such as would be the main interest of the professionally trained pharmacologist, biochemist, physiologist, chemist, pharmacist, etc. Pharmacotherapeutics is the study of the actions of drugs on *diseased* living tissues—the forte of the physician. Toxicology is the study of the actions of drugs as poisons—the concern of those trained in the basic medical sciences as well as in the clinical sciences. Posology is the study of the actions of drugs in relation to their dosage—a problem to everyone interested in pharmacology. With this, then, as the scope of modern pharmacology, it is understandable how so many professionals of varying education, practices, and interests can be called "pharmacologist." Having introduced you to the function of the pharmacologist in respects to pharmacology, let us now take another brief look at function—this time of the kidney in respects to renal pharmacology.

Renal Pharmacology

Water balance is only one of a number of kidney functions (see Fig. 2). Therefore, the status of renal pharmacology involves more than diuretics, even though today we will devote more time to elucidating mechanisms of diuretic activity than to other renal activities. In addition to water balance, the kidney regulates acid-base balance, maintains osmotic pressure and volume of blood, secretes vasopressor substances, and excretes organic waste products and excess inorganic salts.

MATERIA MEDICA
1. Source
2. Description
3. Preparation

PHARMACOLOGY
1. Pharmacodynamics
2. Pharmacotherapeutics
3. Toxicology
4. Posology

Figure 1

RALPH W. MORRIS, A.B., M.S., Ph.D., is Assistant Professor of Pharmacology, Department of Pharmacognosy and Pharmacology, College of Pharmacy, University of Illinois, Chicago, Illinois.

Presented as a talk at the Hospital Pharmacy Section of the Tri-State Hospital Assembly, Chicago, Illinois, May, 1959.

RENAL FUNCTIONS

1. Maintenance of water balance.
2. Maintenance of acid-base balance.
3. Maintenance of osmotic pressure of blood.
4. Maintenance of blood volume.
5. Secretion of vasopressor substances.
6. Excretion of
   a. Organic waste products.
   b. Excess inorganic salts.

Figure 2

TYPES OF WATER IMBALANCE

1. Edema
   a. Heart failure.
   b. Hypertension.
   c. Sodium retention.
   d. Water retention.
2. Polyuria (diabetes insipidus)

Figure 3

Types of Water Imbalance

Most of us are familiar with edema of cardiac origin but there are other forms of water balance (see Fig. 3). Edema may result from hypertension, increased production of aldosterone (resulting in sodium retention), or increased secretion of the pituitary anti-diuretic hormone (producing water retention), as well as due to cardiac failure. Polyuria, characterized by formation of large volumes of urine, may result from a deficiency of pituitary anti-diuretic hormone in which case it is called diabetes insipidus. Administration of vasopressin or the anti-diuretic hormone corrects this cause of polyuria.

Drugs such as dextran, five percent glucose, and polyvinylpyrollidone, are called "plasma expanders" and are used to aid the kidney maintain blood volume and viscosity, such as is necessary to combat hemorrhage and shock. This area of renal pharmacology saw rapid advancement during the war years of the early forties.

Another renal function—that of the excretion of waste organic and inorganic products—has long been over-looked as being of importance to toxicology. The only product of note in this class is probenecid (Benemid), which alters the renal tubular resorption of ureates, penicillin, para-aminosalicylic acid, etc. This depressant action of probenecid can, therefore, either facilitate the excretion (*i.e.* uric acid in gout) or prolong the activity of a concurrently administered drug such as penicillin or PAS. Unfortunately, little interest has been shown in finding compounds capable of increasing excretion of our more common poisons.

BUFFER SYSTEMS

$$Na^+ + H_2CO_3 \rightleftharpoons NaHCO_3 + H^+ \qquad \frac{A}{B} = \frac{(H_2CO_3)}{(NaHCO_3)}$$

$$Na^+ + NaH_2PO_4 \rightleftharpoons Na_2HPO_4 + H^+ \qquad \frac{A}{B} = \frac{(NaH_2PO_4)}{(Na_2HPO_4)}$$

$$Na^+ + \text{protein} \rightleftharpoons Na\text{ proteinate} + H^+ \qquad \frac{A}{B} = \frac{(\text{protein})}{(\text{proteinate})}$$

Figure 4

The kidney plays a role in the regulation of blood pressure, by producing renin, the enzyme which regulates the production of angiotonin, a potent vasoconstrictor drug. Renin itself can cause vasoconstriction but apparently only indirectly by virtue of its actions on angiotonin and not by a direct vascular effect of its own.

Buffer Systems and A/B Ratio

The cells as well as the blood stream of the body contain essentially three buffering systems: bicarbonate, phosphate, and proteins (see Fig. 4). The mechanism for maintenance of *p*H at 7.4 (slightly on the alkaline side of neutrality) is to adjust the acid-to-base ratio by regulating the renal excretion of acids and bases. Let us illustrate this mechanism with the bicarbonate system. The edema resulting from right heart failure produces sodium retention, therefore the acid-to-base ratio will be high in sodium. The kidney compensates for this increased sodium retention by retaining hydrogen ions. Consequently the acid-to-base ratio remains unchanged and the *p*H stays the same even though the absolute concentrations of sodium bicarbonate and carbonic acid are unusually high. Certain of our diuretics, notably the acid-forming diuretic ammonium chloride, act by siphoning off sodium from the buffering systems. As the sodium is removed, the body compensates by decreasing the acid—in the case of ammonium chloride one of the compensating mechanisms is to breath off large volumes of carbon dioxide. Therefore the acid-to-base ratio or *p*H stays approximately the same and large amounts of sodium and water are passed with the urine. The large amount of water excreted is due to the ability of cations, especially sodium, to bind large quantities of water, therefore as the sodium goes so goes the water.

Renal Tubular Acid-Base Exchange

In order to understand the actions of diuretics, we must first understand the basic mechanism of renal tubular acid-base exchange, the most important regulation of water balance in an edematous patient (see Fig. 5). The carbon dioxide and water, either from the tubular blood or from within the tubular cell, combine under the influence of the enzyme carbonic anhydrase to form carbonic acid. Intracellular carbonic acid ionizes producing hydrogen ions which migrate into the lumen of the renal tubule where they exchange

with the sodium of the buffer, and bicarbonate ions which remain intracellular and combine with the translocated sodium from the buffers. The newly formed intracellular sodium bicarbonate then returns to the circulating blood volume and hydrogen ion acidifies the urine. This mechanism—basic to the acidification of the urine—is interfered with by most of our diuretics.

Classification of Diuretics

What methods can be used to increase renal tubular excretion of sodium and water? Basically two—directly decrease renal tubular resorption of sodium or water. The most direct and effective method of decreasing water resorption is to inhibit the anti-diuretic hormone of the posterior lobe of the pituitary gland. The only truly effective depressant of the anti-diuretic hormone is alcohol. For obvious moral and medical reasons this method cannot be recommended. Our classification of diuretics (see Fig. 6) is consequently primarily a listing of drugs effecting sodium resorption. Note that there are many types of diuretics, yet only ammonium chloride (acid-forming), organic mercurials, and the sulfonamides (Diamox and Diuril) are widely dispensed for their diuretic activities.

Mechanism of Water Diuresis

Perhaps the first internally administered drug ever used by man was water, possibly as a diuretic or flushing agent. At least we know water to be the oldest diuretic, although very inefficient by modern standards (see Fig. 7). The ingestion of large quantities of water results in an increased water content of the blood, producing a decrease in the osmotic pressure of the blood. The decreased osmotic pressure precipitates a movement of sodium from the tissues into the blood. In addition the original dilution of the blood reduces the effective concentrations of the anti-diuretic hormone and thus results in decreased renal tubular water resorption. Since the net diuretic effect of the ingested water is one of blocking only water resorption and then to an extent not much greater than the quantity of ingested water, and since water does not pull appreciable quantities of sodium with it, water cannot be regarded as a diuretic, but only as a flushing agent. In fact, the osmotic effect of the water on the blood, may actually in certain cases increase the severity of the sodium retention edema.

Urea

Urea is a "second class" diuretic in that its use is limited mainly to mild edematous cases in which tolerance has developed to other diuretics. The mechanism of action is by increasing the osmotic pressure of the blood thereby pulling water and sodium into the blood from the tissues. The increased water in the blood is

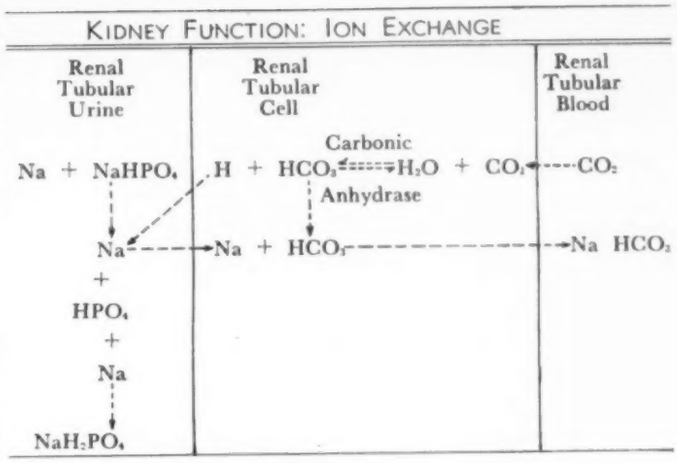


Figure 5

rapidly passed through the renal membranes. The increased osmotic pressure of the renal tubular fluid due to high concentration of renal tubular urea, holds water in the tubules and therefore decreases tubular resorption of water. In addition due to the dilution of the anti-diuretic hormone and aldosterone, renal tubular resorption of water and sodium is further depressed. Unfortunately, not only is urea relatively weak as a diuretic but the taste frequently precipitates nausea in an ill patient. Consequently even prior to such improved diuretics as Diamox and Diuril, urea was of rather limited therapeutic usefulness.

Ammonium Chloride

Ammonium chloride typifies the acid-forming salt class of diuretics: a class which has long enjoyed a solid therapeutic position. The mechanism of action of ammonium chloride (see Fig. 8) is somewhat more complicated than other diuretics in that ammonium and chloride ions each exhibit a diuretic activity. The ammonium ion, called a "labile ion" in that the body metabolizes it to urea, exerts, in the form of urea, a diuretic effect by effecting osmotic pressure of the

CLASSIFICATION OF DIURETICS

1. Osmotic Pressure
   a. Water
   b. Sugars
   c. Urea
2. Salts
   a. Neutral
   b. Acid forming
3. Oncotic pressure
4. Xanthines
5. Organic mercurials
6. Sulfonamides
   a. Acetazolamide (Diamox)
   b. Chlorothiazide (Diuril)
7. Aminouracils (Rolicton)

Figure 6

WATER: MECHANISM OF DIURESIS

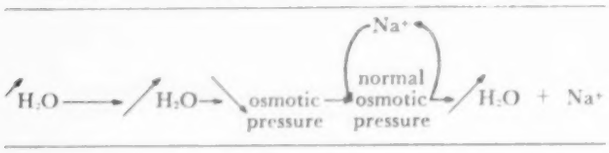


Figure 7

MECHANISM OF AMMONIUM CHLORIDE DIURESIS

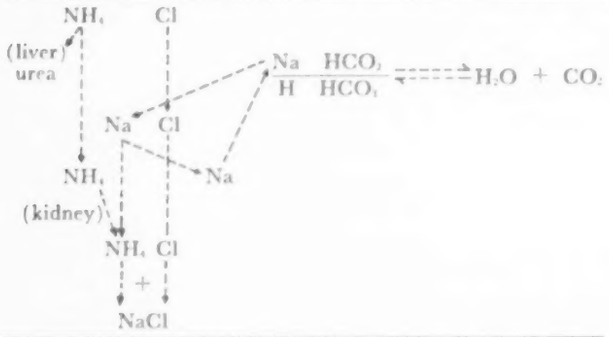


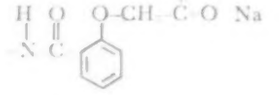
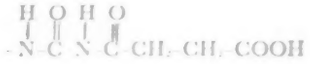
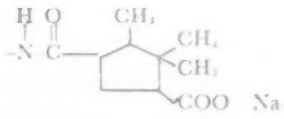
Figure 8

blood as mentioned earlier. The chloride ion, called a "fixed ion" in that there can be no metabolism of it, draws cations, mainly sodium, into the blood stream to effect neutralization of the chloride charge. The large excess of sodium chloride, binding much water, will then be carried to the kidney for excretion. The natural function of the renal tubules is to reabsorb cations, therefore a relatively small portion of the sodium will be absorbed. However, due to the large doses of ammonium chloride used to produce the diuresis, the vast majority of the sodium in the form of sodium chloride, remains in the urine taking with it the large quantities of water. Unfortunately, in three to five days the body makes adjustment to the acid-forming mechanism of ammonium chloride and exchanges ammonium and potassium for the sodium in the renal tubules. The sodium is resorbed and tolerance to ammonium chloride has now developed. A two or three day rest period from ammonium chloride must now ensue, during which time other diuretics must be used.

Xanthines

The xanthines—caffeine, theophylline, and theobromine—all possess similar actions but vary in the degree of activity as central nervous system stimulants, smooth muscle relaxants, and diuretics. Theobromine is the most potent xanthine diuretic but theophylline is the xanthine of choice, since it has very little effect

ORGANIC MERCURIAL DIURETICS

Official Name	Route of Administration	X	Y	R
Mersalyl, U.S.P. (Salyrgan)	I.M.	OH	CH_3	
Mercurophylline (Mercuzanthin) (Mercupurin)	I.M.	OH	CH_3	
Meralluride (Mercuhydrin)	I.M.* Oral	OH	CH_3	
Mercaptomerin (Thiomerin)	S.C.*	Na OOC–CH_2–	CH_3	
Chlormerodrin (Neohydrin)	Oral*	Cl	CH_3	

*Note = drug of choice for that route of administration

Figure 9

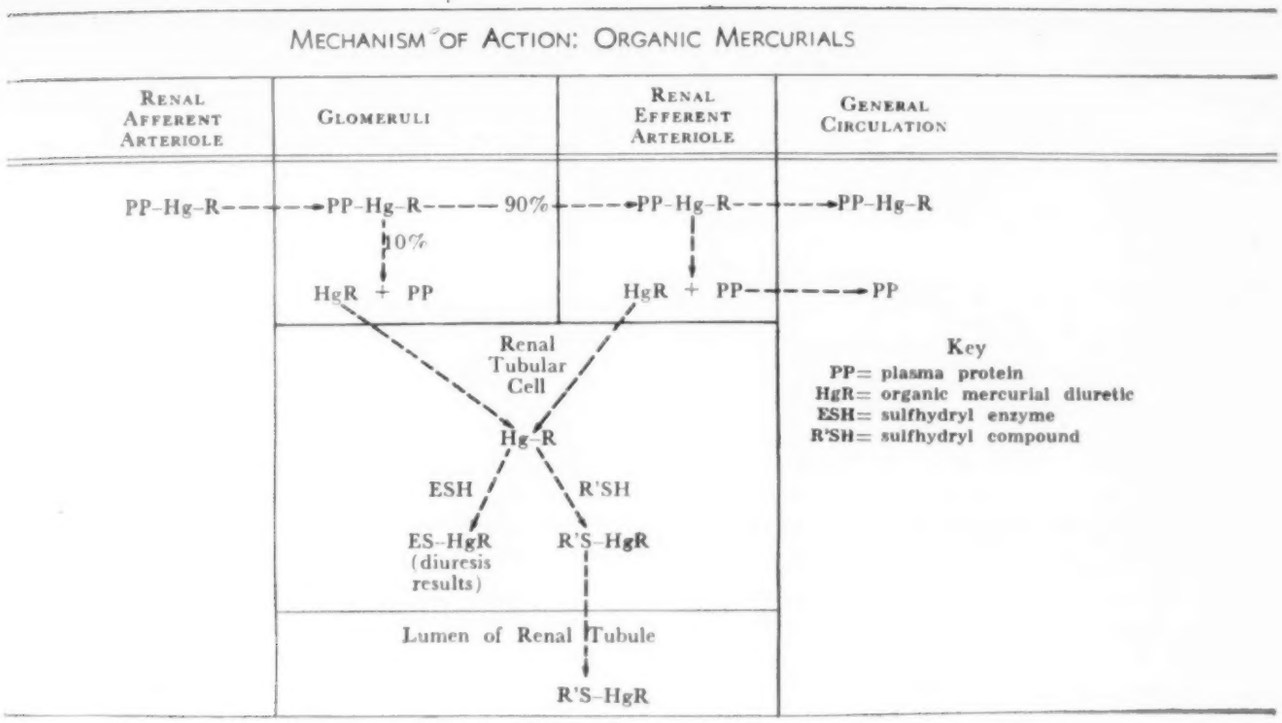


Figure 10

on the central nervous system and has the longest duration of diuretic activity. The most important mechanism for theophylline-induced diuresis is renal tubular blockade of sodium resorption. How this blockade is accomplished remains a secret. There is also an unexplained extrarenal translocation of water from the tissues into the plasma. The increased water content of the plasma is then passed through the kidneys. This translocation of water occurs prior to any direct effects of the xanthines on renal tubular function. An action of less importance is the smooth muscle relaxation in the blood vessels resulting in increased renal blood flow. As the blood flow increases to the kidneys the fluid flow across the renal membrane will also increase and consequently urinary volume increases.

Organic Mercurials

The organic mercurial diuretics (see Fig. 9) are closely related on the basis of their chemical structure. The major differences between members of this group lie in the differences in frequency of side effects and the routes of administration, rather than in the mechanism of action. The X position when altered modifies toxicity, especially cardiac, whereas Y and R substitutions alter mainly solubilities and to a lesser degree toxicity also (see Fig. 10). The organic mercurials, regardless of the route of administration, are carried in the blood stream bound to the sulfhydryl groups of plasma proteins. Upon reaching the renal tubular circulation, 90 percent of the mercurials having by-passed the filtration process of the renal membrane, the drug-protein-sulfhydryl bond is broken and the mercurial diuretic enters the tubular cell. Here the drug either binds with a cellular-sulfhydryl compound, which is a detoxification and not a diuretic mechanism, or binds to an as yet unidentified sulfhydryl enzyme(s). When this enzyme(s) is bound to the drug by means of a disulfide link, its enzymatic activity is blocked. As a result of the enzymatic blockade, tubular resorption of sodium is diminished. The sodium is thus passed from the kidney, again taking with it large quantities of water. The possible toxicity syndrome of organic mercurials is due either to excessive diuresis, resulting in sodium, potassium, and chloride deficiencies, or to the ionized mercury ion itself.

Mechanism of Acetazolamide

Not all diuretics possess the potency of the organic mercurials. Such a class of diuretics is the sulfonamides: Diamox and Diuril. The similarity in chemical structure of acetazolamide (Diamox), methazolamide ethoxzolamide (Cardrase), and Butamide is such that little difference is found in their actions. Therefore what can be said for acetazolamide (Diamox) can be said for the other three and any future drugs of similar structure. Chlorothiazide (Diuril) and its analogue hydrochlorothiazide (Esidrix or Hydrodiuril) are but slightly different chemically from the azolamides but have different mechanisms of action.

Sulfonamides

Here again is the characteristic renal mechanism for acid-base balance. However, Diamox and similar

EFFECTS ON URINARY ELECTROLYTES

DRUG	H_2O	Na^+	K^+	Cl^-	HCO_3^-
Water	+++	(+)	0	(+)	0
Urea	++	++	0	++	0
Ammonium chloride	+++	+++	+	+++	0
Theophylline	++	++	0	++	0
Mercurials	+++	+++	+	+++	0
Diamox	+++	+++	+	0	+++
Rolicton	+++	+++	(+)	+++	(+)
Diuril	+++	+++	+	+++	++
Hydrodiuril	+++	+++	++	++++	+

Figure 11

drugs inhibit the activity of the enzyme, carbonic anhydrase (see Fig. 5). This results in the failure to produce the hydrogen ion concentration which normally displaces the sodium in the renal tubular buffering systems. Consequently the sodium instead of being resorbed in the renal tubule is excreted. All the presently known sulfonamide diuretics, including Diuril and Hydrodiuril, are carbonic anhydrase inhibitors. However, only the azolamides possess sufficient potency as carbonic anhydrase inhibitors to utilize this action as their main mechanism of diuretic activity. The actual mechanism of diuretic activity for Diuril and Hydrodiuril, other than that they decrease tubular resorption of sodium, remains a mystery.

Pyrimidines

Recently a new class of diuretics has been introduced: the pyrimidines as represented by amisometradine (Rolicton). Structurally the pyrimidines resembles the xanthines, which they simulate in action and in toxicity. The drugs are still too new to state a mechanism of action or even a spectrum of therapeutic activity.

Summary and Conclusions

To summarize the actions of diuretics, note that Figure 11 shows the electrolytic increases following therapeutic doses of the common diuretics. The desired therapeutic response is an increase in water and sodium concentrations without affecting the other electrolytes. Ignoring for the moment the factors of potency and toxicity, it is immediately seen that no diuretic is perfect. Only urea and theophylline can be considered to approximate the desired activity.

On the basis of potency, tolerance, toxicity and undesirable side effects, urea and theophylline are also eliminated from our list of "perfect" diuretics. We have now arrived at a very familiar point in pharmacology: that point where, for one reason or another, all available drugs have been eliminated as not being perfect. This is true whether the drugs be diuretics, cardiacs, antihistaminics, antibiotics, or what-have-you. Then what progress has been made in modernizing pharmacology from materia medica?

We have a large number of drugs, sometimes too large a number in our medicine cabinets. Usually due to its characteristics (*i.e.* potency, toxicity, side effects, solubility, mechanism and site of action, etc.) each drug has its own specific as well as general therapeutic application. To you the pharmacist, the perhaps fruitless, never ending but always promising search for the ideal drug means that you will be forever confronted with the problem of new drugs. These new drugs will bear many structural and activity resemblances to older drugs, yet possess new actions and characteristics about which the laiety and the health team will make continuing demands.

In what areas of renal pharmacology can we expect the most rapid changes? We can expect our greatest advances to continue in the area of diuretics. The list of types of diuretics serves as an indication of a still rather large number of types yet to be studied. We should expect an increase in sulfonamides, since Diamox and Diuril have both been promising advancements in safe, effective diuretic therapy.

In the light of the seriousness of hypertension and the recent elucidation and synthesis of angiotonin, we might expect much research in this area. However, few new drugs should be expected since new drugs effective against angiotonin will depend for their effectiveness on a knowledge of the mechanism of action of angiotonin, much of which remains to be discovered.

As a result of extensive advances made during the war years, few drastic changes should be expected in drugs affecting blood volume or the osmotic pressure of the blood. The therapeutic importance of drugs altering renal excretion has never been earnestly studied or for that matter appreciated, especially in regards to toxicology.

Though the status of renal pharmacology in the eyes of the dispensing pharmacist might well be limited to the status of diuretics, we should always bear in mind the total functioning of the kidney: namely, acid-base balance, excretion of excessive quantities of organic and inorganic compounds, maintenance of osmotic pressure and volume of blood, and secretion of vasopressor substances, in addition to the maintenance of water balance.

The only limitations on the zealous search for new drugs might well be how much the pharmaceutical industry is willing to spend and how much the lay public is willing to buy. Until such a time of leveling off occurs, the pharmacist must avail himself of every educational method possible to at least stay abreast of professional advancements. For the pharmacist the "tools of the trade" have changed: pharmacology is a new professional tool. If you are to stay professional, you must keep pace with the profession, or else the profession and the thousands of professionals you serve will surely pass you by.

BASIC SCIENCES

. . . their need in hospital pharmacy practice

by MAXWELL PIKE

► IN RECENT YEARS, HOSPITAL PHARMACISTS HAVE attempted to establish minimum standards of professional performance and to train a corps of qualified hospital pharmacy personnel. To elevate pharmacy to even higher levels of performance, a set of maximum standards and goals is necessary. While training young pharmacists in the best practices, we must also strive to develop in our professional activity an ever increasing awareness and application of new developments, methods, and procedures.

The hospital pharmacist's duties are profoundly affected by the large number of new drugs with potent physiological properties. We are concerned with, more than ever today, drugs which affect specific portions of the brain and autonomic nervous system, as well as electrolyte balances in the blood and tissues. Many of the drugs in use today affect nerve physiology, endocrine glands, and biochemical processes (enzyme inhibition, cell respiration and important

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secretory processes). Pharmacists can no longer avoid the necessity for a high level of familiarity with the contributions of these sciences.

No Substitute for Knowledge

How are we responding to this modern challenge? To answer this question, a current definition of the role of the hospital pharmacist is needed. It might be defined thus: "The pharmacist in a hospital is responsible for the purchasing, dispensing, preparation, preservation and distribution of all medications used in the diagnosis and treatment of disease in humans upon the instruction of a physician." He is obligated, in the patient's interest, to have a complete and current knowledge of the actions of all materials he dispenses. He must always know where to seek new knowledge whenever the necessity arises. The pharmacist must have a sufficient background and knowledge to be able to understand new information, to interpret it accurately, and to put it at the assistance of the physician within the shortest possible period of time.

In recent years, we, in the profession, have begun to think of ourselves with pride as specialists in pharmacology, pharmaceutical chemistry and toxicology, and to my mind, this is a proper view of how a pharmacist *should* be seen by the hospital staff. Unfortunately, we are not always considered in this role by our medical colleagues; if not, we have only ourselves to blame. We think of ourselves too often as administrators of the pharmacy, not as professionals in a scientific field. I would not detract from the important administrative role which the hospital pharmacist plays, but emphasize the wider scope and importance, based on his specialized knowledge, which make the hospital pharmacist a specialist for whom there is no substitute. Because of the huge number of drugs and preparations which are presented to the physician, and the impossibility of a physician being able to collate and review all of the literature describing this avalanche of therapeutic material, he must rely on the hospital pharmacist, who, because of his training, interest and ability, can best perform this specialized function. It is up to the pharmacy profession to be prepared for this important task.

Role of Basic Sciences

I think most pharmacists are basically in agreement with the aforementioned description of the role and do rate a "pat on the back." We can sincerely view our position with pride. But, with the increasing complexity of our hospital "role"—with our specialization in pharmacology, chemistry and toxicology—how many of us are retaining our special position, how many of us continue to deserve to wear the mantle of specialized professionalism?

We have, if we wish to use it, warehouses full of recent information, in textbooks, journals and manufacturers' brochures. We can, if we wish, obtain all of this information "as soon as possible," which very often means *now*. A patient in renal, cardiac, mental or circulatory crisis, cannot wait for information to be dug up tomorrow. The literature which we should have on hand at all times can give us the exact data that the physician requires, if we are sufficiently versed in the language and the subject matter used in describing the pharmacology, chemistry, and side effects of drugs, to interpret properly its meaning.

Many questions regarding drug action and toxicity are put to us daily. These questions concern drugs which are, in many instances, extremely potent, life-saving or extremely toxic, and have a basic physiological nature. These drugs are prescribed for patients who are often very ill and require rapid, accurate and safe therapy based upon the most complete and up-to-date information available. The steroids, antibiotics, diuretics, hormones, and drugs affecting the central nervous system fall into this important group. These drugs have profound pharmacological as well as mild to drastic side effects. The physician must assume the risk of the side effect when the importance of obtaining the curative effect outweighs other considerations. We can perform a most useful service by keeping abreast of these toxic actions. By so doing, we can help the physician to anticipate responses, to make more knowledgeable decisions, and, often to avoid unnecessary complications. However, we engage in this vital activity only if we are properly acquainted with the sciences of physiology, biochemistry, chemistry and pharmacology. Unfortunately, these sciences are only briefly and sketchily taught in the schools of pharmacy. The background information necessary to follow today's advances in drug therapy requires a more thorough understanding of the basic sciences. The American Society of Hospital Pharmacists should urge that studies in the basic sciences be given at a higher level in the schools of pharmacy. It should also urge that students taking graduate programs in hospital pharmacy elect advanced courses in the basic sciences.

Increased Role as Consultant

If we achieve such training, our hospital pharmacies—already organized sections of the hospital—will soon become centers of scientific information attracting a high level of intelligent personnel to the profession. The pharmacy will then be the place where the busy physician receives complete and objective information he requires to properly use today's drugs with a mind free of doubt and uncertainty. When the physician has such faith in the hospital pharmacist, he will be certain that his patients are receiving drugs

which are well prepared and properly used. The incidence of untoward side effects, unnecessary toxic reactions, and lessened therapeutic effectiveness will all be greatly diminished. The physician may then know and respect us as true specialists in our own field, drugs.

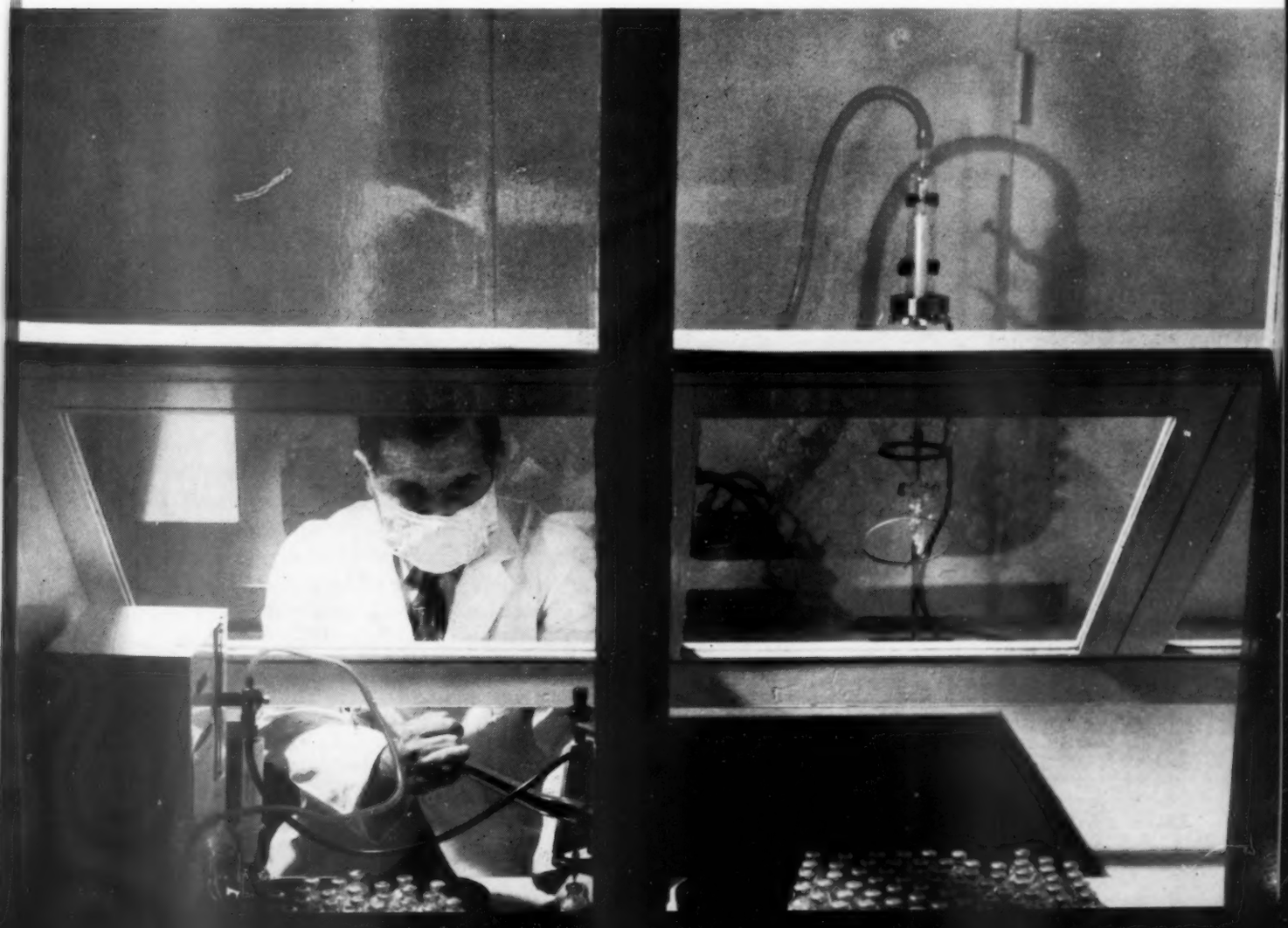
Economic Life

Greater knowledge of the basic sciences can serve to improve the economic life of our pharmacies. Everyday we receive announcements of new drugs, many of which are but different brand names of the same generic material. Many new preparations are offered to physicians which represent but slight variations of drugs already in use, variations which do not differ significantly in their therapeutic effect.

To put this principle into effect, a pharmacist, well versed in the basic sciences, and serving on hospital pharmacy and therapeutics committees, can discuss the newer drugs and advise members of the committees as to which are truly new improvements. He will be listened to—and heeded, to the degree that he has knowledge to back up his opinions and recommendations. This type of pharmacist will succeed in keeping his shelves free of "gimmick" drugs, and his budget down. He must indicate to the medical staff those drugs which are but generic duplicates or pharmacological repeats, and those that will give but slight to insignificantly different clinical results; this type of pharmacist will help the physician discard much superfluous and useless information about drugs. It is not necessary to stock every steroid, antihistamine, diuretic, and tranquilizer offered to the physician; there are few generic differences in drugs, and fewer pharmacological differences, but these slight differences can mean great economic stresses to the hospital.

Discussion Needed

We must stimulate more discussion on the entire subject of the basic sciences and their role in the hospital pharmacy. I would like to see such subjects on the agenda of all of our meetings, chapter and national. I urge the SOCIETY to support and encourage greater levels of study in emphasis on the basic sciences as the single most important step toward improvement of hospital pharmacists and the development of their ever increasingly important role in the care of the hospital patient. I invite the entire field of hospital pharmacy to join in this most interesting pursuit—in a field that is wide open and ours, but for the effort. The opportunities are limitless.



HOSPITAL PHARMACY . . . PAST, PRESENT and FUTURE

Sister Mary John

by SISTER MARY JOHN

► I WOULD LIKE TO TALK TO YOU INFORMALLY about hospital pharmacy as I have known it in the past, the present and my aspirations for its future. Although unbelievable progress has been made through the years, I remember hospital pharmacy when there was little progress.

After graduating from a school of pharmacy, I was assigned to one of our 150 bed hospitals and was to serve an apprenticeship under a retail pharmacist who was to spend a part of the day in the hospital. Strange to say, the pharmacist who filled the hospital prescriptions, when asked to supervise my work refused and said, "Hospitals should not have a pharmacist." Even when we had another registered pharmacist coming in, the doctors would request that their prescriptions be filled by the first mentioned pharmacist. Well, as I also did x-ray and clinical laboratory work I came in contact with the medical staff and soon won their confidence and, without mentioning the subject, the monopoly in prescriptions ceased to be a problem. At that time, there was little to do in the Pharmacy, or rather I did not know how to do it. It was taken for granted that the Surgery Department made both the surgical fluids and the intravenous solutions. I taught pharmacology and chemistry to the student nurses and attended summer school sessions to complete requirements for a degree.

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Adapted from the Harvey A. K. Whitney Award Lecture presented by Sister Mary John at the 1957 Annual Meeting of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, New York City.

Spease and Whitney

Mother Provincial, who had recently heard Dr. Crile extol the nurse anesthetist, asked me if I knew anything about anesthesia. I remarked that I had had a course in anesthesia in France, but never received a certificate. It was not long before another Sister and I were starting our course at the University Hospitals of Cleveland and enjoying the work immensely. The Director of the School of Anesthesia said, "Sister, as long as you are a pharmacist, I will give you permission to spend your free time in the Pharmacy because Dean Edward Spease* can teach you how to save money for your hospital." I appreciated this opportunity and learned much about hospital pharmacy during the year. For instance, only three barbiturates were stocked, phenobarbital, sodium pentobarbital and sodium amobarbital. No new drugs were stocked without being first considered by the Therapeutics Committee. I saw intravenous and surgical solutions prepared where they should be—in the

*Edward Spease was then Dean of the Western Reserve School of Pharmacy, Cleveland, Ohio.

Pharmacy. I know, possibly as well as anyone, the monumental work Dean Spease accomplished for hospital pharmacy in the Cleveland area.

To the younger members of the ASHP I would like to say, do not be discouraged if you are assigned to an area where pharmacy service is not on a professional level; accept the challenge and develop it. When Dean Spease started his career in hospital pharmacy he said, "I visited hospitals whenever I could . . . I expected to see true professional pharmacy in hospitals and was disappointed that it did not exist there."

Dean Spease spent a year observing hospital pharmacy and he accomplished the following:

1. He appointed a pharmacist to work under him at the University Hospitals who took notes of good and bad points.

2. He visited the University Hospitals two or three times a week to evaluate the notes as the administrator had suggested.

3. He then gave the seniors (at Western Reserve University School of Pharmacy) experience in the hospital pharmacy.

4. He established a manufacturing and control laboratory in the School of Pharmacy and made tablets and liquid preparations for the hospital's use, after an agreement was drawn up between the hospitals, the school of pharmacy, and the University.

5. Hospital pharmacy was then taught with supervised instruction to the undergraduates, and later to graduate students.

6. He then selected a Pharmacy and Therapeutics Committee and wrote a drug policy for the hospital and also a formulary.

His formulary worked because drugs in the formulary were included in the inclusive per diem rate and any drug for which an order was sent out for was charged above the inclusive rate. These developments greatly increased pharmacy's prestige with medical and administrative staffs.

When Mr. Harvey Whitney* developed internships in hospital pharmacy, Dean Spease did likewise. Dr. Malcolm MacEachern, Director of the American College of Surgeons, had requested Dean Spease to write the first Minimum Standard for Hospital Pharmacy. This was later adopted by the College of Surgeons. This great pharmacist and Mr. Whitney, have done so much to stimulate the hospital pharmacy movement, to which we owe much of its prestige and standards today. They deserve our deepest gratitude for the legacy they have left to hospital pharmacy. Very few of you present here know of the blood, sweat and tears that have gone into their work.

The blood, sweat and tears were also shed by the able leaders who followed them. Mr. I. Thomas Reamer, as Secretary, and I as Treasurer, of the ASHP during the early years, fully remember the tottering financial structure of the second, third, and fourth years of the Society, when we all enjoy reading The Bulletin* which, at that time was to a great extent, a contribution of Dr. Don and Gloria Francke. I trust the time will come when they will be accorded full recognition for their efforts. According to Samuel Johnson, "Books are tools absolutely necessary to the arts and professions." Well, The Bulletin, and now the Journal, is absolutely necessary to us and has undoubtedly given more help and prestige to the ASHP than any other factor.

Hospital Pharmacy Internships

Mr. Harvey Whitney developed the idea of hospital pharmacy internships and the young men who spent time with him are dedicated leaders of hospital pharmacy today. What makes them so outstanding is that they are so willing to impart their knowledge to others. I remember on one occasion when I was admiring this model hospital pharmacy at Ann Arbor, comparing their 100 gallon formulation to be prepared to my 20, and Mr. Whitney remarked, "Sister, do not be discouraged, I started in with only a large spatula."

In 1945, Mrs. Evlyn Scott, Chief Pharmacist at St. Luke's Hospital in Cleveland, persuaded me to take an intern in hospital pharmacy. I do not think, as I remember this fine girl, that I was well enough perpared for the program at that time. One must have enough help for the routine work without depending on the intern for help. This gives the Chief Pharmacist time and opportunity to mold the intern as did the preceptor of old so that at the end of the year he has covered the required curriculum and his basic knowledge will represent, to a degree, what the Chief Pharmacist has taken years to acquire. In my internship program I have used the material from Pharmacy Institutes, MacEachern's *Hospital Organization and Management,* Walter's and Underwood's books on sterilization, and Flack's *Manual for Internship.* Also, I have sent my intern to lectures given to the nurses and physicians. In teaching interns and students in our specialty, I think a textbook in hospital pharmacy covering the theory to be taught at the weekly lectures would be helpful. Because of the time and effort involved, only those interns who intend to remain a reasonable length of time in hospital pharmacy and

*Harvey A. K. Whitney was then Chief Pharmacist at University Hospital, Ann Arbor, Mich.

*The Society's official publication was known as The Bulletin of the American Society of Hospital Pharmacists from 1944 until 1958. Beginning in 1958, it became the American Journal of Hospital Pharmacy.

who are of high intellectual ability, alert, interested, and conscientious should be accepted.

Professional Relations

The intern should be well trained in *professional relations*. He can acquire this by observing his preceptor in dealing with the medical staff. The physician is confused by the multiplicity of tradenames for the same drug and glad to learn that the cost of prescriptions to his patients can be greatly reduced by using the generic name when prescribing. The intern can observe how this problem is placed on the agenda and presented to the Therapeutics Committee. He should attend this meeting as well as the medical staff meeting where this and similar problems are resolved. A common method of solution is to have the physician sign a card stating,

"I hereby authorize the pharmacist of_____ Hospital to use the drug of generic name for the tradename drug I may order. Date _____ Signed_____M.D."

The intern can accompany the pharmacist to the Nursing Office and see how he convinces the Educational Director that the use of generic names in charting medication will help to raise hospital standards. The doctor has already given you permission individually or at a staff meeting to label medicine generically and if he wishes it, you will include one or more tradenames in parentheses on the label. Some time ago the Secretary of the American College of Apothecaries stated:

Excessive duplication should be avoided. It is costly and potentially dangerous to all concerned. It raises the cost of medical care and how much more of this increase the public

Quotes from Tributes to Sister Mary John

We are all very happy especially at this evidence of the work of Sister Mary John . . . I would like to extend to her, on behalf of all of the Sisters, every good wish for what she has accomplished and I hope that she will live long and continue for many years to give us all a good example which we might well emulate.

M. R. KNEIFL

May the heart of Sister understand and the memory of Sister long retain, O Lord, the full import of the tribute we pay her this evening and may we in turn be inspired by her selflessness and her devotion and be moved thereby to do more and more by Thy greater honor and glory.

THE REVEREND PATRICK J. FRAWLEY

. . . I would like to remark only upon this career that has been so devout and so dedicated, that has had the enterprise to transfer some of these activities into the field of hospital pharmacy. I feel that we all have been rewarded thereby.

HARVEY A. K. WHITNEY

. . . it is fitting that hospital organizations are represented tonight because most of us have concentrated our efforts in one area of the professional aspect of hospital work where Sister Mary John, as you can see from the program, has been a pharmacist, a nurse, an anesthetist, has worked in the laboratory, has worked in the X-ray, and I am certain that she has other little private projects which she carried on all the time at Mercy Hospital.

JOSEPH A. ODDIS

. . . I came to realize that Sister has that inner radiance given to those who have learned to meet the challenges, difficulties and delights of each day cheerfully, with humor, faith and courage, and who get pleasure out of doing and expecting no return.

ANNA GROSSO

It is a pleasure to be here this evening on behalf of the Michigan Society of Hospital Pharmacists and as their representative to present the Whitney Award.

DONALD MELCHER

will take without demanding socialization of our health professions in problematical. The use of generic names is completely consistent with the professional training given the modern-day pharmacist and is an ethical approach wherein he may be able to reduce an excessive and in certain cases an unreasonable inventory.

By all means, the generic drug must meet the specifications of the U.S.P., N.F., and N.N.D. for quality and potency.

Education of the resident medical staff in the use of medications should be the duty of the pharmacist. The physician must be kept informed through bulletins issued by the Pharmacy and Therapeutics Committee, by the use of pharmacy displays and other methods. The medical, resident and intern staffs should be shown the many duplicate products which appear. New drugs of value should also be shown with authentic information. It is also necessary to talk to the head nurses about drugs.

Stock Control

Stock control is likewise very important in training the pharmacy intern as is the commercial aspects of cost accounting and pricing. Too often the hidden costs of indirect expense are often ignored. The importance of turnover must be borne in mind. According to the National Cash Register Statistics, it costs eight percent per month to stock any medicine regardless of whether it is manufactured or purchased from a manufacturer. An item doubles in cost if not sold within a year.

The intern must be taught how to spend the hospital dollar and that placing orders once monthly in larger quantities will lower the price. For instance, one pharmacist found, after checking several manufacturers' prices, that the average price of inexpensive capsules or tablets stood like this:

5000 cost	100%	or $100.00 ($20 per M)
1000 cost	100%+20%	or $ 24.00 ($24 per M)
100 cost	100%+20%+50%	or $ 3.60 ($36 per M)

In other words, you can purchase 10 brands of 100 for $36.00 or one brand of 5000 at $20.00 per 1000. Our interns learn the value of the hospital dollar by purchasing under supervision.

Central Supply

Central supply training makes the preparation of sterile products easy. The Chief Pharmacist and the intern need to take a weekly inventory together in Central Supply and the new procedures that have been adopted should be explained to the interns. Writing out purchase specifications for equipment for Central Supply is also good training for the intern who later wishes to supervise Central Supply. The highly trained pharmacist who has training in specialized areas, should command a very good salary commensurate with savings effected, so that he can afford to remain in hospital pharmacy. I favor a bonus for savings annually.

Procedural Manuals

The intern must be taught the use of procedural manuals. I agree with Dr. George Archambault who has stated that there is an essential need for the value of establishing and circulating within a hospital, and in particular, within the Pharmacy Department, a procedural manual for a Pharmaceutical Service, a manual spelling out in detail the Department's administrative policies, regulation, and *modus operandi.*

The intern must also be taught the value of the Point Rating Plan as developed by Mr. Ray Kneifl of the Catholic Hospital Association. According to my dear friend, Evyln Scott:

> We cannot wait for sufficient special formal training such as internships of hospital pharmacists but must turn to self education. Three aids have been mentioned: first, *The Bulletin;* second, the Institutes; third, conventions and meetings. To me, the Point Rating Plan represents more than a tool to implement the *Minimum Standard*—rather it represents an opportunity for every hospital pharmacist to become aware of where he and his hospital stand as regards the standards for hospital pharmacy in the United States.

Value of Intern

It may seem that the intern is a liability to the hospital, but he is really an asset. For instance, through surveys and studies which were conducted by the interns under my supervision, we eliminated expensive germicides that were not germicidal under actual conditions of use. A survey of the amount of gauze needed to adequately protect a clean wound resulted in saving gauze and adhesive. I remember Mr. Leroy Wiedle of St. Louis showing me a product that he had made popular because it was a good product. I remarked that we did not have a need for it and he said "create the need." I have followed his advice. For instance, we have replaced a commercial dressing by adding a topical anesthetic and 0.05 percent PCMX to witch hazel and have an improved anesthetic and bacteriostatic episiotomy dressing. We dispense about 3,000 tubes annually of each — Sterile Breast Ointment and a Diaper Rash Cream that are effective. We developed a sterile Placenta Paste which is healing to burns, ulcers, decubitis and skin grafts, which we sell to other hospitals and pharmacies. We also prepare an artificial sterile spinal fluid with the *p*H adjusted to that of normal spinal fluid, which it replaces. This is used in other hospitals of the city, because "we have created the need." Research studies pay dividends which would not have been possible without the intern's enthusiastic assistance.

This enthusiastic activity of my assistant intern

seems to keep me young. You may find us in the Laundry supervising the washing and drying of surgical gloves, checking medicine cabinets at nursing stations, attending meetings with physicians and nurses, making out financial reports, or checking control reports.

Toledo Formulary

The Toledo Hospital Council covers about thirty hospitals and uses the *Academy of Medicine Formulary,* as do the retail drug stores.

Administrators were interested in our formulary because, according to a statement by John Zugich,

> The accrediting and approval body for the nation's hospitals, the Joint Commission on the Accreditation of Hospitals, requires that the hospital have an active Pharmacy and Therapeutics Committee which shall develop a formulary of accepted drugs for use in the hospital. Chief Pharmacists . . . find this responsibility essentially delegated to them.

As I am Secretary and Treasurer of the Academy of Medicine's Formulary Committee, our interns have good training in this field. An intern typed the present book and its supplements. This book will be revised and printed after the U.S.P. XVI becomes official.

Our interns are taught that compounding and dispensing is only a small part of the pharmacist's duty. A shift in emphasis is due and the pharmacist of today must be equally skilled in imparting comprehensive professional information to the allied health professions.

As I see it, the young physician has a lot of money and time invested in his education. The hospital pharmacist in cooperation with the Pharmacy and Therapeutics Committee should see that the intern's education continues at the same level.

Future Trends

The future is in God's hands, but He expects us to use our abilities to improve our service for humanity. I predict that heated autoclaves will become obsolete, sterilization will be done in a few minutes without heat, perhaps by radiation. We are beginning a new era. The expansionist trend in hospitals of tomorrow, and even today, points toward a separate pavilion for ambulatory cases where patients will require less expensive nursing care. There will be patients' dining rooms and recreation rooms in these pavilions. More medical cases will increase the volume of drugs dispensed. These will be paid for by a third party who will want prices to reflect costs. Hospital revenue must be equal to expenditures without overcharging, so unnecessary expenditures must be curtailed. It is the pharmacist's major duty to maintain rational therapeutics in his hospital. He must keep well informed about drugs so that he is able to withstand the flood of unsubstantiated claims that are often made for new products. A professional doctor's degree is almost mandatory for the Chief Pharmacist. He will then be better able to evaluate critically and with authority. He needs more biological and advanced organic chemistry and pharmacology so that he can explain the pharmacological action of a drug and relate this to its structural formula. To challenge scientifically, one needs an equality of knowledge. The physician, so skilled in the basic sciences, is still vulnerable to the high-pressured salesmanship of even non-pharmacists. The hospital pharmacist, in order to help the physician maintain rational therapeutics should have a more extensive academic training leading to a Doctor of Pharmacy degree. I have a manufacturing pharmacist, a Baroness from the royal family of Holland who studied Medicine and Pharmacy in a seven year combined concurrent curriculum. According to her,

> In Europe, medicine and pharmacy have equal prestige. Medical technology, but not pathology, is included with pharmacy so that the clinical laboratory supervision is divided between the Doctor of Pharmacy and the Doctor of Medicine, who has charge of Pathology. Both are on equal status.

Foreign pharmacists applying for an internship on the Visitors Exchange Program all seem to be medical technologists as well, and many have a doctor's degree.

In conclusion, may I ask, what would be better for our numerous small hospitals than to have an individual trained at the level of the Doctor of Pharmacy to supervise several departments such as Purchasing, Medical Technology, or Central Supply, as well as Pharmacy. For this responsibility, the pharmacist should receive a good salary—one commensurate with his education. To improve the future, we must work with our Schools of Pharmacy today.

In parting let me express my sincere gratitude for receiving the Whitney Award. Let each of us dedicated to better patient care build up our own department. God willing, hospital pharmacy marches on.

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ON APOTHECARIES AND MEDICAL CENTERS . . .

a centennial celebration

by JOHN J. ZUGICH

Pennsylvania Hospital Pharmacy, Philadelphia about 1895

PHOTO: SMITHSONIAN INSTITUTION

a modern Medical Center in the Midwest

► IT WAS EXACTLY TWENTY YEARS AGO that my classmates and I were just completing our college period —among the same halls where we meet tonight and among the early beginning of what now is the greatest concentration of associated medical center buildings anywhere in the world.

In a relatively short time, these same classmates and I, as well as the faculty have been privileged to witness an evolution—if not a revolution—in pharmacy and medicine.

Twenty years ago, it is safe to say, none of us could foresee the extent of some revolutionary developments in health. We were thrown into a so-called "golden era" and "age of miracle drugs." We learned that pharmacy as a health profession does not exist in isolation. Its very soul and mission in society are dependent in keeping in stride with rapid evolution—which is still continuing—toward better public health today.

One single measuring stick speaks for the total progress since our graduation. A bonus of ten years in life expectancy for us and for our children has been earned by the "break throughs" in knowledge for better health since we left these buildings.

We have also witnessed a true pharmaceutical revolution. The influences of changing medical practice and science have not left pharmacy untouched. The social attitudes for personal rights toward better health are rapidly undergoing change.

Of these evolutionary signs, I would like to speak tonight.

Evolving Perspectives

It is my conviction that you as students can then use such a perspective to answer your personal questions. They are, I am sure, simple but nevertheless difficult questions—questions of work to do, opportunities to find and ambitions to satisfy.

Yet, as I mention only two decades, we are actually helping to commemorate five times that period tonight. It is the focus on one hundred years of continuous contribution by an institution. We should not leave this

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Presented as a centennial address at the University of Illinois, College of Pharmacy, Chicago, Illinois, April 14, 1959.

special occasion without some pride in association with it.

Classroom schedules and laboratory routines cloud the student's perspective of his institution—it did mine. Time and distance must intervene before true and different values crystallize.

The real dimensions of this professional college have been tested by time. Its founders, its faculty and students of 1859 are long gone. Three generations have separated their personal concerns and way of life from ours.

If twenty years mentioned has been revolutionary, the general environment of the students and faculty of 1859 seems crude and static by comparison. "Education" was largely centered on the preceptor's verbal instructions to the apprentice. The student was still removed 30 years from reading under an electric light. Wind power was still the basis of transportation across the ocean. The student's personal concern would soon be on volunteering for Army duty which would find him in Tennessee or Mississippi fighting his own countryman. Herbal decoctions, infusions and massive metallic doses were to be his mysterious stock in trade and skill as a professional. It was a period when a Frenchman's scientific curiosity was absorbed in studies on the causes of spoiled wine which would later revolutionize medicine. An Englishman's observation of the use of carbolic acid in deodorizing sewage was to project the theory of antisepsis which would revolutionize surgery for all time. The hub of treatment of disease was an appalling amount of purging. The mystery of epidemic infections was a major fear of that generation.

An Englishwoman five years before had quietly proven that soap, cleanliness and organized tender loving care to soldiers fallen in battle in far off Turkey would help change the hospital's place in society. Her nurse associates were later to establish the first schools of nursing and a new health profession.

Eight ounces of whiskey, body straps and stout hearts were the accepted anesthetics which sustained individuals under heroic mutilation in hospitals that went under the guise of surgery. Hospitals served only the unfortunate, the sick poor. The buildings were ill-designed and ill-ventilated. Many were built to be burned periodically to get rid of infection. Perfumed air tried to disguise the pungency of "laudable pus" and suppurating wounds. The hospital apothecary was seldom seen for there was still to be a war and another 15 years before there would only be 150 hospitals in the entire country. This was part of the environment of the time of the first classes and our colleagues who generations gone established this institution.

College Provides Sustaining Link

Tonight, after 100 years, we take pride in this association which they established for us.

The founders would also take pride today to see a college supported by the people at large and a part of a great university. They would see the only professional school of its type serving equally the needs of cities and rural towns of a great state.

The collective teaching and thinking of all its faculties through ten decades have sustained new standards and principles of pharmacy to meet the health strides of each generation. The procession of former students has obviously served the needs of evolutionary health programs well for the period in which they lived.

The college has been the heart in maintaining pharmacy as an honorable profession and calling. The hucksters, chauvinists and single-minded proprietary interests have been on the fringes in all generations—to no lasting influence. The college provided the sustaining link which nurtured the integrity, professional heritage and public respect among its generations of practitioners. Other schools of succeeding periods with less purpose did not fare as well and have disappeared.

Mission in Society

A profession well taught, associated with health and well-being of men, needs no protective pseudo-ethical codes or trade secrets to maintain respect. The chief measure of respect will come in the general performance of its mission in the society in which it finds itself.

The long range test of the college and its body of pharmacy practitioners is now in this era, more than ever crystallized in a single direction—its contribution and mission to the public health. Peripheral and side activities necessary for economic survival of the proprietary merchant or tradesman have reached new levels but they cannot overshadow the basic charter of pharmacy. The national body of more than 100,000 pharmacy practitioners today can leave a professional heritage sustained by their colleges. Or, if its public health charter is perverted, leave a hybrid dying, artificial profession carried in its real purpose only by a select few of future generations.

The way of life you establish is partially dependent on observing the evolutionary sign posts within and outside the health services affecting pharmacy. The questions confronting you on the work to be done as a professional person can thus more easily be settled in your heart and mind. This respected institution has instilled the synthesis of a hundred years teaching and thinking in you. Let us touch on perspectives surrounding the profession which may affect your decision.

Opportunities

First are the opportunities of today one may find. They are greater than in the early period of my classmates or in other generations.

We have entered an era of specialists as the body of

knowledge grows and health sciences proliferate. Pharmacy has seen this unprecedented development equally with other professions.

The opportunity for the "general practitioners" of pharmacy remains greater than ever, however. The attraction of directing an independent and self-governing enterprise will be the motivation for most. With the growth of population estimated as an additional 50 million persons in 20 years, (or when you are in your early forties) and with the trend of increased number of small pockets of residential areas on the fringes of all towns and cities, the opportunities are well substantiated.

It is in the field of specialists in pharmacy that additional opportunities lie. This is a newer development of recent years.

Medical Representative

The rapid introduction of new pharmaceuticals—an average of more than one new product every day in the last ten years—has established the demand for the physician-consultant representing the pharmaceutical industry. The popularly called "detail man" or sales representative is now an accepted and very necessary team member to keep our physicians informed. The number in this pharmacy specialty has increased to a ratio of one to every twelve physicians in this country. The intricacies of health information and drug distribution has even fostered specialists within this specialty.

Research

There is no doubt that greater opportunities will be found in pharmacy education for those who are adequately equipped and endowed. With the continued growth of the population, the demand for more practitioners will mean more students. This will require a greater ratio of teachers to prepare them with necessary professional skills and judgment. It has been estimated that 600 new persons with Ph.D.'s will be needed in the next 5 years by pharmaceutical education and industry.

The opportunities for the technically and intellectually suited in research have increased. Both private and governmental research in health fields has achieved previously ignored emphasis. Research now has increased beyond the university laboratory to a growing and highly dynamic pharmaceutical manufacturing group, to related industries that are diversifying interests into pharmacy, and to greatly expanded research activities in all medical centers.

Hospital Practice

The continued acceptance and greater utilization of hospitals will offer new opportunities. More persons are employed in them than in the automobile industry. Large hospitals continue to grow into larger medical centers and new hospitals are being built daily in new concentrations of population. The expected increase annually of beds for a growing population has been projected as 30,000 annually, This is the equivalent of 150, two hundred bed hospitals each year. The projected needs based on attrition of pharmacists and new hospital beds has been estimated to be from 380 to 470 annually.

For those interested, opportunities will be greater in former irrelated callings. The demands for skilled specialists in pharmaceutical business management, manufacturing and production direction, law, journalism, market research are now being filled by default in many instances by those who do not necessarily have a base of pharmacy knowledge.

The evolution of the specialist and broader opportunities are evident. The present recognition that pharmacy can contribute to the public health beyond the past image of only the corner druggist can be construed as a sign of greater professional maturity. This latter circumscribed point of view of a limited mission for pharmacy is still widely held. Those with vision, however, embrace the concept of broader and rightful professional opportunities in the new scheme of advancing health services.

Apothecaries and Medical Centers

One area which I would like to single out concerns hospitals, apothecaries and medical centers. Past discoveries, demonstrations and advances in this setting have affected broad practices in medicine and, with it, pharmacy. It is not unreasonable to expect that the character of each will be equally influenced in the future from this source.

The old time hospital apothecary, surrounded by crocks of macerating vegetation and doling out empirical drug combinations to the destitute poor, had a depressing association. The buildings he worked in were a port of last resort for the sick. The public's image was associated with a vertical entrance to the hospital and a horizontal exit to the burial ground. There were justified reasons.

At the time this college was founded, amputation of a leg or arm was the standard treatment for most compound fractures. Among these patients approximately one died out of every two admitted. Of every group of twenty-five women admitted in labor, three to four would succumb. Oliver Wendell Holmes satirized the defenseless apothecary by saying, "What wonder the Stars and Stripes wave over doses of ninety grains of quinine and that the American eagle screams with delight to see three drachms (180 grains) of calomel given at a single mouthful?"

In the hospital wards the nurse associates of the apothecary "pinched snuff" to make the stink of infection tolerable. The piercing screams from the operating theater did not breed confidence. It can be imagined the pounding fear of patients as the priests, preceded by an attendant tolling a bell, slowly passed from ward to ward to administer last rites to the sick and infected women in lying-in hospitals. These were not uncommon conditions surrounding the hospital's apothecary.

Little More Than Compassion

As a combination dispenser of drugs, steward and keeper of general supplies in the hospital, he and his co-workers had little more than compassion to assist in combatting wound infections, pain, hemorrhage and death. The "break throughs" in the scientific understanding of antisepsis, anesthesia and infections were yet to come. With it would be a flood of influences which changed, in time, his own professional work and the character of his hospital.

The hospitals of our time further depict some influences which will affect future practices in medicine, and in pharmacy which must keep in stride.

Modern Skills Expand

Many hospitals of today are "medical centers." They do not need the fanciful title nor do they need to be limited to metropolitan resources. Thousands of them have directed and organized educational programs for the physician trainee, the nurse, the laboratory technician and others. They engage in research. Costly diagnostic and therapeutic facilities stand by.

It is now common to see more than just a sprinkling of latest advances in them. The radio-isotope laboratory and its continuing diagnostic-therapeutic developments are not confined to the big city center. The hospital surrounded by the cornfields in the Midwest or the desert out in the West has such facilities. Neither are the extra-corporal mechanical devices (that assume kidney function or oxygenation of blood while the surgeon incises the heart) limited to university centers and their research development. Such devices are purchasable, similar to an anesthesia machine. Radiation equipment incorporating the equivalent of 75 million dollars worth of radium is installed in hospitals far removed from Chicago, New York or Los Angeles. Present advantages of communication and transportation make the latest "miracle" drugs available to the remotest community.

Modern skills of surgical and medical specialists now reside in many smaller communities and are not confined to metropolitan university centers. (Witness how the world has beaten a path to a former rural community in Minnesota where the health care dispensed enjoys an international reputation).

Associated with both the large and miniature medical centers in thousands of the communities today is the modern pharmacist. His surroundings differ from the apothecary.

His institution now serves one person out of every eight in the community each year. It is the health center for the acutely ill, the overnight preventive check-up, and the birth of all its new citizens. It is often the community's largest health school, "hotel" and employer.

Taken collectively, the impact centered in almost 7,000 hospitals across this country in treating the sick, in teaching and research show early signs ahead for both medicine and pharmacy. Some will stem from scientific advances; some may be social.

Social and Economic Developments

The social and economic developments impinging on health programs have been slow to emerge. But changed conditions are evident.

Since our graduation, one phenomenon has occurred that few visualized. During a twenty year period, 121 million persons have chosen to spread the risk of the cost of illness on a voluntary basis. It largely aimed at covering illness requiring hospitalization.

We are now in the throes of the first major impasse. It is the result of mounting and, sometimes, prohibitive cost on the individual, the apparent gaps in coverage and future reservoir of the unprovided for elderly.

It is a time of great soul searching and consideration of principles under which health care will be organized in the future. We are not dealing solely with philosophy but, in a time of plenty, with actual economic conditions which may force new attitudes. The practicing pharmacist, the physician and the public will not be on the periphery of the present hospital centered problem.

Public influences and attitudes are forcing the road ahead. The spread of risk among a broader base of the population, with broader health service coverage is no idle attitude among mounting powerful and vocal groups. Developments make it no longer a question of government responsibility for the health interest of the nation. It is now a question of how much—and in what form.

United States is the only nation of consequence at present which does not sponsor and finance through its government comprehensive health care for its people. To do so is contrary to our present principle of voluntary control over the destiny of personal health needs. However, evolution has taken its toll in this direction.

Present federal responsibility has grown to cover in whole or in part, the health services for 31 million persons or almost one-fifth of our population. One per-

son of every eight admitted to hospitals is the responsibility of the federal government. Just recently, 5 million federal government employees have been added.

Of the medical research conducted today, the federal government sponsors over 50 percent; 250 million dollars annually are involved. The expected expenditure in ten years will be one billion dollars annually.

Under consideration is the hospital coverage of our population which is over 65 years of age. The number involved is equivalent to the entire population of Canada. The use of Social Security funds has much popular favor. It may be only a matter of when and how the government will sponsor care for this group and their increasing numbers.

If these are no more than creeping signs, the road is clear. Health care programs in the United States are moving toward new forms of relationship between the providers and the receivers. More comprehensive care than now exists under voluntary programs will interject an agent or agents. If this care becomes "comprehensive," the practicing pharmacist will not be untouched.

Observe the programs closely in the next few years. Diversionary but sincere experimentation will be the forerunner of the final pattern under which your professional way of life may be involved.

Work and Ambitions

What recent evolution or possible future "break throughs" in medical practice and science are to be considered by the student in determining the work to do, the opportunities to find and the ambitions to satisfy?

Man-killing infectious diseases are no longer the concern which they were as late as twenty years ago. Chemotherapy and antibiotics have spawned an almost undreamed of series of products. This "breakthrough" has been of real tangible benefit to pharmacy practice.

The largely empirical approach to the treatment of the mentally ill will have its veil lifted. Much promise appears in biochemical understanding of at least some most important mental disturbances. The pharmacist in this break-through will have a much larger role than the present "tranquilizers" he dispenses.

There is a general air that we are on the threshold of new understanding of malignancy and the control of wild proliferation of body cells. Chemotherapy and hormone balance show much promise. Imagine what may occur if 15 to 20 percent of hospital admissions are diverted to home treatment. The pharmacist's role will be more than the provider of opiates during the all too frequent terminal phase today.

Future advances in knowledge of degenerative diseases should usher in undreamed of specifics of a biochemical controlling nature. Surgery's final frontier will be the replacement of entire diseased organs by transplantation.

The sum and substance of all will be a longer life span. In 1859 when the college began classes, the average life span was forty years. During the time of its existence, thirty years has been added. It is expected there will be a six fold increase in those over 80 years of age, numbering almost five million persons as you reach your own "early forties."

Greater demands will be made of the pharmacist. He must be equipped with not mere manual dexterity. He will need an intellectual understanding of complex pharmocological and biochemical processes treated to be truly useful on the health team.

This is self-evident today. The influx of therapeutic agents (90 percent of those prescribed which were unknown twenty years ago) almost overwhelms the human capacity to assimilate their significance without hard-earned basic understanding. The challenge is great for both the college and the student to provide this intellectual equipment.

The hospital apothecary and the pharmacy colleague of his day have disappeared. In their place are men and women tested year after year by a new health environment often explosive in advances. Many of these advances will be first reported from medical centers and hospitals. Others will be born in pharmaceutical or university laboratories.

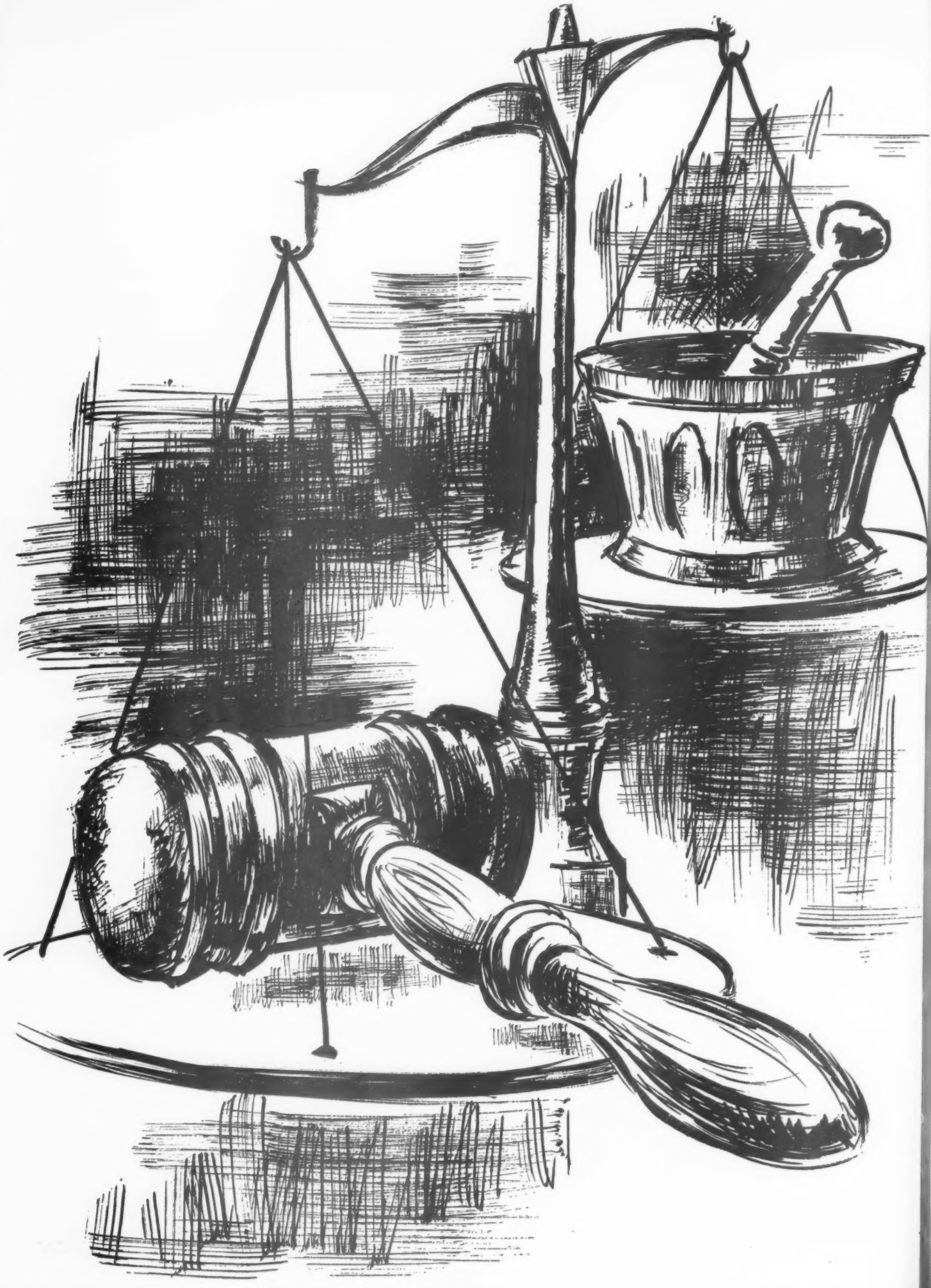
Professional Growth

Opportunities for continued professional growth and the ambitions to satisfy in the profession will be along more paths than have been available to those before you. One factor is certain—it will challenge the best of what you have learned here in order to maintain professional respect of the public health team.

In conclusion, allow me to say you will in turn set the heritage for others who follow in the profession. No matter what course of interest in pharmacy you follow, the "old order changeth." You will discover the principles which have been taught in these halls. They will stand out in time from the multiple technical facts and skills now so much a part of you.

The college after 100 years of similar tests still releases you, as they have others, as a practitioner of a respected and honorable calling. It has a charter in society which, regardless of diversions and peripheral interests, should not be submerged.

The way of life you follow will rest as a responsibility to more than yourself alone. It now belongs to a larger group. To accept this larger responsibility for a written or unwritten code is the mark of a professional. We all assumed it on entering as students, as did the others before us during the college's one hundred years.



Commonwealth of Pennsylvania
Department of Public Instruction
State Board of Pharmacy
Harrisburg, Pennsylvania

State Board of Pharmacy vs. Joseph V. D'Ambola

BRIEF ON BEHALF OF JOSEPH V. D'AMBOLA

History of the Case

► Joseph V. D'Ambola, the above-named respondent, is now, and since November 9, 1954, he has been, a duly licensed registered pharmacist, No. 21,914; and he is now, and since November, 1954, he has been the Chief Pharmacist at the Hahnemann Medical College and Hospital of Philadelphia.

On November 17, 1958, the State Board of Pharmacy issued a citation against Mr. D'Ambola, stating that available information indicated that he had allegedly substituted certain drugs for other drugs, and that the alleged acts constituted violations of the State Pharmacy Law, the Act of May 17, 1917, P.L. 208, as amended, 63 P.S. 318. The citation also contained a notice that the State Board of Pharmacy would hold a hearing to investigate Mr. D'Ambola's activities as a pharmacist, at Room 200 Education Building, Harrisburg, Pennsylvania, on December 8, 1958, at 10 A.M., to determine whether or not, while acting as a pharmacist, Mr. D'Ambola had been guilty of violating Section 6 of the aforesaid Act of May 17, 1917, P.L. 208, as amended.

The hearing was held before the Board on December 8, 1958, according to the notice, and at the hearing, the testimony and evidence presented to the Board established the fact that the citation against Mr. D'Ambola was based upon two, and only two, transactions in which Mr. D'Ambola was involved or with which he was connected in any way, namely, (1) the dispensing of certain drugs to Dr. Leonard H. Shapiro, an instructor in Gynecology and Obstetrics on the Faculty of Hahnemann Medical College, and a member of the Staff of Hahnemann Hospital; and (2) the dispensing of certain drugs to Harvey I. Miller, a graduate student in the Hahnemann Medical College.

The matter is now before this Board for its determination of the question, whether or not, under the

established facts and the law applicable thereto, the respondent has been guilty of any violation of the provisions of Section 6 of the Act of May 17, 1917, P.L. 208, as amended.

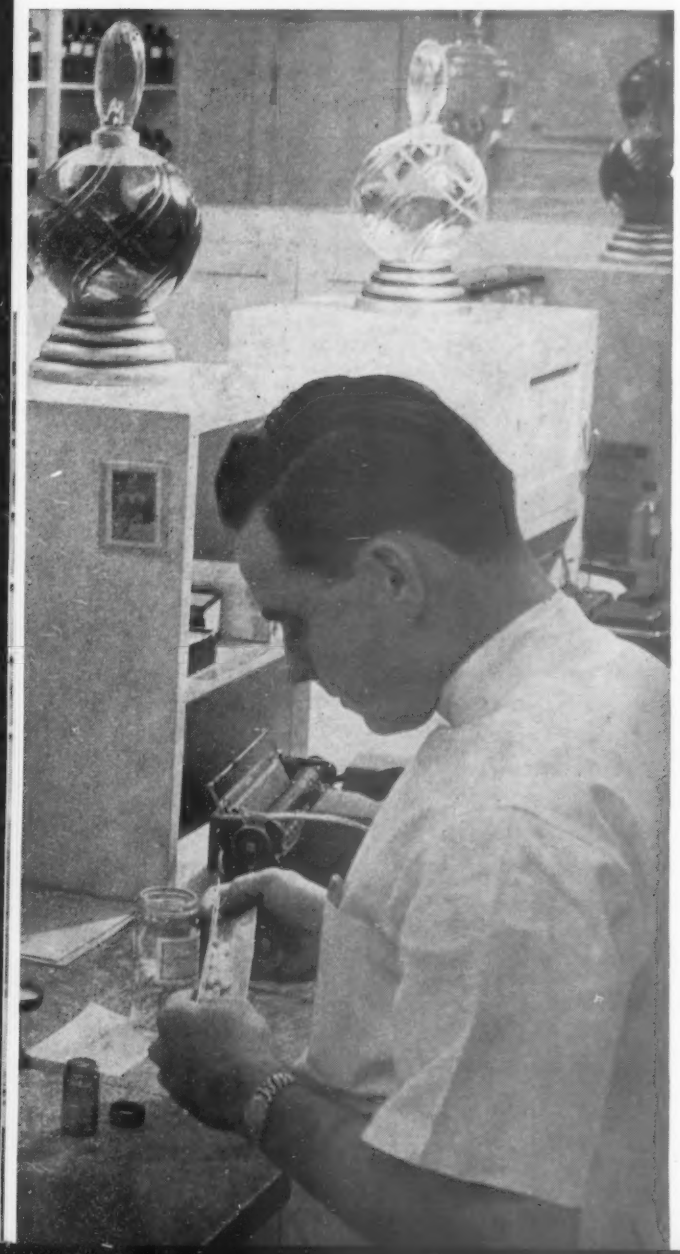
Facts

The evidence presented to the Board at the hearing established the following facts:

A. The Shapiro Transaction:

1. In June, 1958, Dr. Leonard H. Shapiro, who is and was an instructor in Gynecology and Obstetrics at Hahnemann Medical College and a Staff Physician at Hahnemann Hospital, consulted Dr. B. Marvin Hand, Professor and Head of the Department of Neurology in Hahnemann Medical College, with reference to a neuritis condition from which Dr. Shapiro was suffering. (N.T. 42.)

2. Dr. Hand verbally advised Dr. Shapiro, without writing a formal prescription, to take Meticorten, aspirin and vitamin B-1 injections for his neuritis condition. (N.T. 42-43.)



Meticorten is a brand name used by the Schering Corportion for a drug, the generic name of which is "prednisone," and the said drug is also produced by other manufacturers. (N.T. 88, 98, 52, 20.)

3. Dr. Shapiro immediately went to the Hahnemann Hospital Pharmacy, talked to D'Ambola, the Chief Pharmacist, and, without presenting a prescription, verbally requested Meticorten, aspirin and vitamin B-1. (N.T. 43, 50.)

Because Dr. Shapiro was a duly licensed physician, as D'Ambola knew, he was entitled to obtain these drugs for his personal use without a prescription. (N.T. 22-23, 168.)

4. D'Ambola, however, informed Dr. Shapiro that the Pharmacy did not stock the Meticorten brand of prednisone, but could supply prednisone manufactured by another company if this was acceptable to Dr. Shapiro. (N.T. 44-45, 52, 167, 176).

D'Ambola further informed Dr. Shapiro that while the Pharmacy did not sell drugs to Staff physicians, he could lend these drugs to Dr. Shapiro with the understanding that acceptable replacements would be returned to the Pharmacy. (N.T. 44, 51, 167, 169.)

5. Dr. Shapiro advised D'Ambola he would accept the prednisone in stock in lieu of Meticorten, and that he would replace the drugs which he received. (N.T. 44-45, 48, 56.)

At D'Ambola's direction, James M. Smith, an assistant pharmacist, then gave Dr. Shapiro aspirin, vitamin B-1 and prednisone manufactured by a company other than Schering Corporation. (N.T. 216.)

6. Dr. Shapiro subsequently returned to the Pharmacy, and, in D'Ambola's absence, obtained an additional supply of prednisone from Smith, with the understanding that it merely was loaned and should be replaced. (N.T. 47-48.)

B. The Miller Transaction:

1. Harvey I. Miller, a graduate student in Physiology in Hahnemann Medical College, consulted Dr. Martin Fuchs on June 25, 1958, with regard to a dermatitis condition resulting from ivy poisoning. (N.T. 69, 113-14, 119.)

Dr. Fuchs is an Associate in Medicine in Hahnemann Medical College, and is the physician in charge of student health facilities at Hahnemann Hospital. (N.T. 68-69.)

2. Dr. Fuchs gave Miller a prescription calling for Meticorten, phenol and calamine lotion. (N.T. 69.)

3. Miller took this prescription to the Hahnemann Hospital Pharmacy and presented it to Smith. Because there was no Meticorten on hand, Smith filled the prescription with prednisone manufactured by another company. (N.T. 17, 115, 214.)

4. D'Ambola had no contact with Miller and had no knowledge of this transaction. (N.T. 168-69, 214.)

5. Smith, moreover, was authorized by the Hahnemann Hospital formulary to fill Dr. Fuchs' prescription in this manner, and did so in good faith. (N.T. 218.)

The Hahnemann Hospital formulary expressly authorizes the Pharmacy, where a prescription presented to it requests a generic drug listed in the formulary but refers to the drug by a manufacturer's brand name, to fill the prescription with the same drug produced by another manufacturer which is in stock and without further contacting the prescribing physician. (N.T. 37, 46, 70-71, 76-77, 98, 170.)

Prednisone has been listed in the formulary since October, 1957, and the Pharmacy was authorized to stock and dispense the particular prednisone which it had on hand on June 25, 1958. (N.T. 98, 111, 135, 176-78, 203, 205-07.)

6. Dr. Fuchs, at the time that he wrote Miller's prescription, was fully aware of the fact that the formulary authorized the Pharmacy to fill his prescription in this manner, and he knew, and was fully aware of the fact, that he previously had agreed that the Pharmacy, without further contacting him, could fill his prescriptions in the manner permitted by the formulary. (N.T. 70-71, 58.)

Argument

A. *Since Dr. Shapiro was informed by D'Ambola that the Hahnemann Pharmacy did not have the Meticorten brand of prednisone which he requested, and since Dr. Shapiro agreed to accept the prednisone which the Pharmacy then had in stock, D'Ambola did not violate the State Pharmacy Act of 1917, as amended, when he dispensed prednisone to Dr. Shapiro.*

Dr. Shapiro and D'Ambola both testified that when Dr. Shapiro first called at the Hahnemann Pharmacy, Dr. Shapiro asked D'Ambola for a quantity of Meticorten tablets for his personal use, and that D'Ambola then told Dr. Shapiro that the Pharmacy did not have Meticorten in stock, but that it did have in stock prednisone tablets manufactured by another company. Dr. Shapiro then agreed to accept the prednisone on hand in lieu of Meticorten, whereupon D'Ambola loaned him a supply of prednisone tablets, explaining that it was not the policy of the Pharmacy to sell drugs to members of the Hospital Staff for their personal use, the policy being to lend such drugs to the Staff members, subject to the return of the loaned drugs in due course. (N.T. 44-45, 52, 167, 176.)

The testimony of Dr. Shapiro and D'Ambola on these facts was direct and unequivocal, and there was no direct testimony to the contrary. It is true that the Schering Corporation, the private prosecutor, introduced evidence of later conversations between its representatives and Dr. Shapiro, and Dr. Shapiro was questioned about these later conversations, in an effort to discredit Dr. Shapiro's direct testimony that he knew he had received prednisone tablets and not Meticorten tablets. However, this evidence was so vague, indefinite, and conjectural that it clearly did not overcome, or even weaken, the direct and positive testimony of both Dr. Shapiro and D'Ambola that Dr. Shapiro was told, and clearly understood that the drug being loaned to him was not Meticorten, manufactured by the Schering Corporation, but that it was the same generic drug, prednisone, manufactured by another company.

It should also be noted that D'Ambola was not present at the conversations between the Schering Corporation's representatives and Dr. Shapiro, and accordingly, these conversations being *res inter alios acta* as to D'Ambola, are in no way binding upon him, nor can they be used to support any charge made against him.

It is also to be noted that there was evidence that Dr. Shapiro had returned to the Pharmacy at a later date, and had obtained an additional supply of prednisone tablets. However, there was no evidence as to what transpired on the occasion of this second call of Dr. Shapiro at the Pharmacy, and accordingly, this transaction may be, and should be, ignored for all purposes of this proceeding.

This being the state of the record with respect to the Dr. Shapiro transaction, D'Ambola was not guilty of any violation of the Act of 1917, as amended. When Dr. Shapiro agreed to accept prednisone instead of Meticorten, he, in effect, withdrew his initial order for Meticorten, and substituted a new order for the prednisone which D'Ambola had in stock. Hence, when D'Ambola dispensed prednisone to Dr. Shapiro, he was complying exactly with Dr. Shapiro's new order, and in so doing, it is clear beyond any doubt that he did not violate any of the provisions of the Act of 1917, as amended.

B. *With respect to the Miller transaction, D'Ambola did not violate the Act of 1917, as amended, in the sale of prednisone to Miller under Dr. Fuchs' prescription for Meticorten, because the prescription was filled by Smith without D'Ambola's knowledge, and moreover, Dr. Fuchs had previously consented to the filling of the prescription in this manner.*

In determining whether or not D'Ambola was guilty of violating any of the provisions of Section 6 of the Act of 1917, as amended, it is important to consider the exact wording of the said Act, which reads as follows:

"The State Board of Pharmacy shall have power to . . . suspend or revoke the registration of any pharmacist . . . for any of the following reasons:

"(3) *Knowingly* compounding, dispensing or selling, or *knowingly* causing or permitting the compounding, dispensing or sale of any drug . . . *which is of a brand* . . . other than that *specified* by the person ordering or prescribing such drug, unless, in the case of a drug dispensed pursuant to a prescription, the *consent* of the prescriber is first obtained . . ." (Provisions not pertinent eliminated and emphasis supplied.)

Preliminarily, it should be noted that a determination that D'Ambola was guilty of a violation of the above-quoted statute in connection with the Miller transaction would be grossly unfair, unwarranted and unsupportable. The undisputed testimony established the fact that Dr. Fuchs' prescription was actually filled by James M. Smith, then an assistant pharmacist, and that D'Ambola had no knowledge whatsoever about this prescription or the manner in which it was filled. (N.T. 168-169, 214.)

Hence, it would obviously be improper for this Board to hold or determine that D'Ambola was guilty of "knowingly compounding, dispensing or selling . . . any drug . . ." in connection with this transaction. Moreover, it would also be improper for this Board to hold or determine that D'Ambola was guilty of ". . . knowingly causing or permitting the compounding, dispensing or sale of any drug. . . . ." in connection with this Miller transaction. D'Ambola did not cause or permit Smith to fill Dr. Fuchs' prescription, using prednisone instead of Meticorten. On the contrary, in so filling the said prescription, Smith, an employee of Hahnemann Hospital, was acting under the authority of the formulary established by Hahnemann Hospital to govern the operation of the Pharmacy.

Therefore, if any party is to be charged with knowingly causing or permitting Smith to dispense prednisone on a prescription calling for Meticorten, that party is Hahnemann Hospital and not D'Ambola, and if such action on the part of the Hahnemann Hospital is improper, it is not an action coming within the scope of the above-quoted statute. However, it is earnestly submitted that the Miller transaction did not involve any violation of the Act of 1917, as amended, either by D'Ambola, Smith or the Hahnemann Hospital. The evidence presented to this Board clearly established the fact that when Dr. Fuchs accepted his appointment as a member of the Staff of Hahnemann Hospital, he agreed that in the event that he issued any prescription calling for a drug by its brand name, the Hospital Pharmacy, with his consent, could fill the said prescription using the identical drug manufactured by another company, possibly under another brand name. (N.T. 70-71, 58.)

Thus, when Smith dispensed prednisone tablets to Miller on Dr. Fuchs' prescription calling for Meticorten tablets, Smith dispensed the said drug ". . . .pursuant to a prescription," and he dispensed the prednisone in lieu of Meticorten with "the consent of the prescriber . . . .first obtained . . . .," thus complying with the requirements of Section 6 of the Act of 1917, as amended.

It may be suggested, however, that the Act of 1917, as amended, should be construed as requiring a pharmacist, to whom a prescription is presented calling for a drug by a brand name, to obtain a new or *specific consent* from the prescriber to the filling of that particular prescription using the same drug manufactured by some other concern; and that the said Act does not authorize or permit the pharmacist so to fill such a prescription under the authority of a *general consent* previously given by the prescriber to the pharmacist, wherein the prescriber has authorized the pharmacist to fill any and all prescriptions which he may issue calling for a drug by a brand name, using the same drug manufactured by some other concern. It is earnestly submitted that such a construction of the Act of 1917, as amended, would be erroneous, invalid and unlawful for the following reasons:

1. *Giving full effect to the words set forth in the Act of 1917, as amended, according to their plain and ordinary meaning, the Act requires only a general consent, and does not require a specific consent, to the filling of any particular prescription using the same drug manufactured by some other concern in lieu of the drug prescribed by a brand name.*

Although the Act of 1917, as amended, prohibits any pharmacist from ". . . .knowingly compounding, dispensing or selling . . . any drug . . . which is of a brand . . . . other than that specified by the person ordering or prescribing such drug . . . .", the Act expressly states that this prohibition shall not apply if ". . . . in the case of a drug dispensed pursuant to a prescription, the consent of the prescriber is first obtained . . . ."

The Act does not define the word, "consent," and it certainly does not state that a *specific consent* must be obtained with respect to each such prescription. Hence, it would seem to be clear beyond doubt that a previously obtained *general consent* is a "consent" within the meaning of the Act, and fully satisfies the requirements of the Act. From this premise, it necessarily follows that when Smith dispensed "prednisone" to Miller, in lieu of the Meticorten prescribed in Dr. Fuchs' prescription, Smith was acting under the au-

thority of "the consent of the prescriber . . . . first obtained," in strict accordance with the Act of 1917, as amended, and therefore, Smith's action in so doing was clearly not a violation of the said Act.

2. *The Act of 1917, as last amended by the Act of October 6, 1955, P.L. 658, 63 P.S. Section 318, is a penal statute, and as such, it must be strictly construed.*

That the Act of 1917, as amended, is a penal statute is obvious from a reading of the text of the Act. In other words, the Act clearly prescribes penalties, i.e., the revocation or the suspension of the registration of any pharmacist or assistant pharmacist for any of the reasons specified in the Act.

Moreover, the fact that the Act of 1917, as amended, is a penal statute, is plainly indicated in the title of the Act of 1955, which reads as follows:

"AN ACT

Amending the act of May seventeen, one thousand nine hundred seventeen (Pamphlet Laws 208), entitled 'An act to regulate the practice of pharmacy and sale of poisons and drugs, *and providing penalties for the violation thereof;* defining the words 'drug' and 'poison'; and providing for the appointment of a board which shall have in charge the enforcement of said law, and the power to make rules and regulations for the enforcement of said law; and providing for the purchase of samples of drugs for determining their quality, strength, and purity,' further providing for the suspension and revocation of registration by the State Board of Pharmacy." (Emphasis supplied.)

That a penal statute must be strictly construed is established by the Statutory Construction Act of May 28, 1917, P.L. 1019, Article IV, Section 58, 46 P.S. Section 558, which provides as follows:

"All provisions of a law of the classes hereafter enumerated shall be strictly construed:

"(1) Penal provisions; . . . ."

The manner in which this rule of construction is to be applied is stated in 82 Corpus Juris Secundum, page 930, Section 389, as follows:

"In order that a transaction may be within a penal statute it must be clearly within both the *spirit and the letter* of the statute; and *if there is a fair doubt* as to whether the act charged is embraced in the prohibition, *that doubt is to be resolved in favor of the person against whom enforcement of the statute is sought.*" (Emphasis supplied.)

It would seem to be clear that there is not only a "fair doubt," but a *grave* doubt that the action of a pharmacist in filling a brand name prescription using an identical drug, under the authority of a general or blanket consent previously given by the person issuing the prescription, does not come within the "letter" of the Act of 1917, as amended. In order to bring such an act of a pharmacist within the Act of 1917, as amended, it would be necessary to read into that Act, or to add to the said Act, the words, "with respect to each such prescription . . . .", so that subsection (3) of Section 6 of the said Act would then read as follows:

"(3) Knowingly compounding, dispensing or selling, or knowingly causing or permitting the compounding, dispensing or sale of any drug . . . . which is of a brand . . . . other than that specified by the person ordering or prescribing such drug, unless, in the case of a drug dispensed pursuant to a prescription, the consent of the prescriber is first obtained *with respect to each such prescription.* . . ."

It certainly requires no argument to establish the proposition that the rule requiring penal statutes to be strictly construed, forbids any construction which, in effect, reads into, or adds to, the statute words which are not present, in an effort to make the statute cover or penalize acts which do not come within the meaning of the words actually used in the statute. See *Altieri vs. Allentown Officers & Employees Retirement Board,* 368 Pa. 176 (1951).

Therefore, the Act of 1917, as amended, being a penal statute, must be strictly construed, i.e., the said Act must be construed by giving effect to the words used according to their plain and ordinary meaning, and so construed, the act of Smith in dispensing "prednisone" to Mr. Miller in lieu of Meticorten, did not constitute a violation of the said Act, as more fully explained under point 1, supra.

3. *The Act of 1917, as amended, should not be construed to require a specific consent to the filling of each prescription from a brand-name drug by using the same drug manufactured by some other concern, because such construction would produce an unreasonable result, and might result in the Act being declared to be a violation of the Constitutions of the United States and this Commonwealth.*

At the hearing in this proceeding, testimony and evidence was adduced with respect to the operation of hospital pharmacies, and particularly the Hahnemann Pharmacy, under the so-called "formulary system." This Board is so thoroughly familiar with this system, the reasons why it has been established, and is being used, in substantially all of the larger hospitals in this country, and the manner in which a hospital pharmacy is operated under the system, that it would not seem to be necessary to review this evidence in detail in this brief.

However, it should be noted that it was clearly established by the evidence presented to this Board that if the Act of 1917, as amended, is construed to require the Hahnemann Pharmacy to obtain the *specific consent* of the prescribing physician to the filling of a prescription calling for a brand-name drug using the same drug manufactured by some other concern, this "rule of specific consent" would impose a heavy and expensive burden on the operation of the Pharmacy.

Thus, it was established that as a result of the intensive advertising efforts of the drug manufacturers, physicians frequently are more familiar with some manufacturer's brand name for a drug, than they

are with its generic name. (N.T. 104, 197.) As a result, they may use the brand name and the generic name interchangeably, or they may prescribe the drug by its brand name, intending only to prescribe the drug and not actually intending to prescribe *only and specifically* that particular brand of the drug. (N.T. 197, 70.)

Hahnemann Pharmacy fills an average of about 600 prescriptions a day, and from 10% to 15%, i.e., from 60 to 90, of these prescriptions may specify a drug by its brand name. (N.T. 149, 174, 191.) It was, and is, believed that Hahnemann would have to employ an additional pharmacist if the Pharmacy should be required to obtain the specific consent of the prescribers to the use of a synonymous drug in the filling of prescriptions calling for drugs by their brand names. (N.T. 175.) In any event, a considerable delay, and conceivably, a serious delay, in providing a drug for a patient might occur, if the Pharmacy was required to obtain the consent of the patient's physician before filling the prescription for the patient, or to obtain the brand-name drug from an outside source. (N.T. 127-128, 142-143, 175.)

On the other hand, it would seem to be crystal clear that *the "rule of specific consent" would be of no benefit whatsoever to anyone.* In other words, when a prescription calling for a drug by its brand name is presented at the Pharmacy, it certainly makes no difference, (a), whether the pharmacist then calls the prescriber and obtains his consent to fill that particular prescription using the same drug manufactured by some other concern, or, (b), whether the pharmacist, acting under the authority of a "general consent" previously obtained from the prescriber, proceeds to fill the prescription in exactly the same manner. *In either case,* the prescription will be filled using the same *generic* drug prescribed, but with a drug manufactured by some other concern.

It thus appears that a construction of the Act of 1917, as amended, which would require the "consent" therein referred to, to be a specific consent with respect to each prescription, would impose a heavy, expensive and unnecessary burden on hospital pharmacies, and indeed, on the physician members of the hospital staff, and that the requirement would be of no benefit to anyone. Such a construction of the Act would be utterly unreasonable, arbitrary, and capricious, and accordingly, that construction is forbidden by the rules set forth in the Statutory Construction Act of May 28, 1937, P.L. 1019, Article IV, Section 52, 46 P.S. Section 552, as follows:

"In ascertaining the intention of the Legislature in the enactment of a law, the courts may be guided by the following presumptions among others:

"(1) That the Legislature does not intend a result that is absurd, impossible of execution, or unreasonable;

"(3) That the Legislature does not intend to violate the Constitution of the United States or of this Commonwealth;. . . ."

It should also be noted that the fact that the Act of 1917, as amended, if construed to require a *specific consent* in the situations referred to above, would be unreasonable, not only indicates that that construction is not proper, but such fact further indicates that if the Act should be so construed, it is believed that it would violate both the Constitutions of the United States and of this Commonwealth, i.e., so construed, the Act would constitute an unreasonable and unwarranted infringement of the rights of the persons involved without due process of law.

For these reasons, it is earnestly submitted that the Act of 1917, as amended, should not be construed to require a *specific consent* in the situations herein discussed, and that properly construed, the Act only requires a *general* or blanket consent to have been previously obtained from, or given by, the prescribing physicians.

It is further submitted that under the latter, and proper, construction of the Act of 1917, as amended, the Miller transaction involved no violation of the said Act, and accordingly, this citation against D'Ambola should be dismissed.

C. *The actions of D'Ambola and Smith in placing or writing "Meticorten" on the boxes in which prednisone was dispensed to Dr. Shapiro and Mr. Miller, did not constitute violations of the Act of 1917, as amended, because said actions, even if improper (which they were not) do not come within the scope of said Act of 1917.*

At the hearing before the Board, much was made of the fact that the word, "Meticorten," had been placed or written on the boxes in which "prednisone" was dispensed to Dr. Shapiro and Mr. Miller, in one case by D'Ambola, (N.T. 167), and in the other cases by Smith, (N.T. 214, 216).

Dr. Shapiro was given two boxes of prednisone, both bearing the word, "Meticorten." D'Ambola gave him the first box, Board Exhibit No. 5, (N.T. 167), after he had explained that the Pharmacy did not carry "Meticorten," but that it would "lend" him "prednisone." (N.T. 167.) At that time, D'Ambola told Dr. Shapiro that he was writing "Meticorten" on the box for Dr. Shapiro's information. (N.T. 176.)

Smith gave Dr. Shapiro a second box, Respondent's Exhibit No. 1, (N.T. 216-217), also marked "Meticorten," but Dr. Shapiro already knew that the Pharmacy did not carry "Meticorten," and Smith put this word on the box only to enable Dr. Shapiro to identify it. (N.T. 216-217.)

Smith also filled Dr. Fuch's prescription for Mr. Miller, and in so doing, gave Miller a box, Board's Exhibit No. 3, which had "Meticorten" typed on the

label, and "prednisone" stamped on the end of the box. (N.T. 12.) Smith explained this transaction as follows (N.T. 214-215):

"Q (by Mr. Brock) I show you the Board's Exhibit No. 3, and ask you if you can identify that box or that exhibit?

"A (by Mr. Smith) Yes, this is presumably the box that I gave to Mr. Miller.

"Q Did you prepare the label on this box?

"A Yes, sir, I did.

"Q Why did you put Meticorten on there?

"A At the time Mr. Miller presented me with this prescription, and after he returned from the dean's office with the money to purchase it, we became involved in a conversation about poison ivy. Since I myself am afflicted with it from time to time I was quite interested in it. We began discussing the nature of steroids being used as anti-inflammatory agents in such cases. At that time I believe I explained to Mr. Miller the difference between Cortisone and prednisone, and the various trade names, and how all steroids had a certain configuration, and that most of the steroids and trade names that come out now are just variations on that general configuration. I did this because I assumed he was a student and he seemed to be very interested in this product.

"At his request then, I asked him whether I should put the trade name on the label so that he might do further research into the product. I did this only because the generic name was stamped on the end, and since most of the literature available on drugs of this nature is put out by the various companies, I typed the trade name Meticorten on the label for his own knowledge."

Thus, it is clear from the evidence concerning both the Shapiro and the Miller transactions, that neither D'Ambola nor Smith intended to deceive Dr. Shapiro or Mr. Miller by placing "Meticorten" on the boxes of "prednisone" delivered to them, and it is equally clear that Dr. Shapiro was not deceived,—he knew he was getting "prednisone." Moreover, the evidence would not support a finding that Miller was deceived, or that he thought Smith gave him "Meticorten." Miller's testimony does not contradict Smith's testimony set forth above,—Miller's testimony only indicates that after talking with Shissler, a Schering Corporation salesman, he became concerned (unnecessarily) about the quality of the "prednisone" dispensed to him, and that he, Miller, therefore prevailed upon Schissler to *give* him a supply of Meticorten.

In any event, even if the actions of D'Ambola and Smith in placing "Meticorten" on the boxes given to Dr. Shapiro and Miller were improper, (which is not conceded except *arguendo*), they did not constitute violations of the Act of 1917, as amended—the said actions do not come within the scope of the said Act. That Act is only concerned with the *nature, character* or *chemical analysis* of the drug dispensed —it is not concerned with the *misbranding* or *mislabeling* of the drugs dispensed.

In other words, for the reasons hereinbefore explained, D'Ambola and Smith were authorized to supply "prednisone" to Dr. Shapiro and Mr. Miller instead of Meticorten. They did not have to put any name on the boxes delivered to them, but there is not one word in the Act of 1917 which purports to forbid, or make unlawful, their action in placing the word, "Meticorten," on them, even if they had done so with intent to deceive. Such actions might constitute a violation of some other law, or possibly give rise to a cause of action by the Schering Corporation against them, but said action would not support a citation under the Act of 1917, as amended.

Conclusion

In conclusion, counsel for the respondent directs the attention of the Board to the fact that it is *not* contended on behalf of the respondent that the construction of the Act of 1917, as amended, herein supported, should apply only to hospitals, and that a different construction should apply to private pharmacies, although this was suggested at the hearing in this matter. On the contrary, it is submitted that under the Act of 1917, as amended, any private pharmacy may also obtain a general or blanket consent from one or more physicians wherein the said physicians consent that such pharmacy may fill brand-name prescriptions issued by them using the same generic drug manufactured by some other concern, and upon obtaining such consents, such private pharmacy would be fully authorized to fill the prescriptions issued by such physicians as indicated, just the same as a hospital pharmacy is authorized to fill such prescriptions under the authority of the general consents given to them by the members of the hospital staff.

It is earnestly submitted, therefore, that for the reasons hereinbefore set forth, Mr. D'Ambola, respondent herein, has not been guilty of any violation of the Act of 1917, as amended, and accordingly, the citation issued against him under that Act should be dismissed.

Respectfully submitted,

Dated:
February 16, 1959.

/S/ WALTER J. COLLINS, JR.
/S/ J. WARREN BROCK
OBERMAYER, REBMANN, MAXWELL & HIPPEL
Attorneys for Joseph V. D'Ambola, Respondent

Consulting WITH BOWLES

GROVER C. BOWLES JR., *Baptist Memorial Hospital, Memphis, Tennessee*

► How is it possible to arrive at reasonable quantities of medications to be prescribed for outpatients?

The amount of medication to be prescribed must be determined by the physician. It should be based upon the requirements of the patient. In order to avoid wasting medication in prescribing for outpatients, you might suggest the following regulations to the medical staff and the hospital administration.

(1) Patients with acute conditions will usually discontinue medication or should return for a check-up within one week. Therefore, only one week's supply of tablets, capsules, ointments, etc., should be prescribed.

(2) Liquids given in teaspoonful doses, three times a day, such as cough mixtures, should be prescribed in 120 ml. quantities or less.

(3) Frequently, it may be desirable to prescribe a medication that will last for two weeks or longer, either because it will not be necessary for the patient to return before then or because it is reasonable to expect the medication will be continued even if the patient returns sooner. Vitamin B Complex elixir, aluminum hydroxide gel and digitalis preparations would be examples of such medications. However, no more than a 30-day supply should be prescribed.

(4) Ordinarily, eye liquids, nose liquids, ear liquids should be prescribed in 5 ml., 15 ml. quantities. Larger quantities will become grossly contaminated and will rarely be used.

(5) Medication prescribed by drop dosage for routine use should be limited to 30 ml. or 60 ml.

► Would you please send me the name of the Company making the Kardex Unit for Nursing Stations.

"Kardex" is a tradename used by the Remington Rand Company. You may therefore direct an inquiry to Remington Rand, 315 Fourth Avenue, New York 10, N. Y.

► Who is responsible for narcotic control in hospitals?

The administrative head of the hospital is responsible for the proper handling of narcotics within the hospital. Ordinarily responsibility for the purchase, storage, dispensing and proper accounting for narcotics within the hospital is delegated to the chief pharmacist.

► Where can we obtain hexachlorophene?

Hexachlorophene is supplied by the Sindar Corporation, 336 West 44th Street, New York 36, New York.

The following question and answer is reprinted from *The Journal of the American Medical Association* with the thought that it will be of interest to hospital pharmacists.

► Many intravenous feedings and transfusions started in hospitals cannot be completed and must be restarted. What are the percentage and the causes of such failures? Are they all due to dislodgment of the needle in the vein, or are other factors involved?

M. D., Pennsylvania

A survey was made on seven surgical wards, totaling about 200 beds, and it was found that about 450 intravenous infusions of fluid and 27 blood transfusions are given on these wards per month. This does not include those given in the operating room. Of these, 185 are started by a doctor, 250 by a nurse anesthetist, and 15 by a ward nurse. There are about 55 failures or restarts each month, an incidence of 12.2%. A number of factors are involved in failures necessitating a restart: (1) poor or inaccessible veins due to infancy, obesity, or such factors; (2) poor placement of the needle and poor choice of site, allowing easy dislodgment; (3) improper insertion of the needle, with puncture of the posterior wall, or poor anchorage, allowing dislodgment; (4) extreme restlessness of the patient; and (5) moving and transporting the patient from operating table to litter to bed in the recovery unit to litter to ward bed. There were no reactions to intravenous infusion in the period of study, so this was not a factor in failure to complete the infusion. There was a 1% incidence of minor reaction to blood transfusion, but this often is not immediate and does not necessarily terminate the transfusion prematurely. It is apparent that most failures and restarts are due to human error factors. Insertion of a plastic catheter through the needle for retention in the vein obviates some but not all of the failures. However, this consultant's experience is that thrombophlebitis eventuates in about 48 hours. Rate of flow of intravenous infusion was not incriminated but is important. Too rapid flow may cause leaking around the needle, with external compression of the vein and failure. Too slow a flow fatigues the patient to the point that he moves or may intentionally remove the needle.

(*J.A.M.A.*, Nov. 22, 1958)

Therapeutic Trends

edited by WILLIAM JOHNSON

Nicospan—Sustained Release Nicotinic Acid

This study show sustained-release nicotinic acid to be more effective in lowering cholesterol levels than nicotinic acid *per se*. This sustained-release tablet contains 500 mg. nicotinic acid in a special base which is liberated over a period of 7-11 hours after ingestion. After one week of administration to 10 patients, Nicospan reduced cholesterol levels by 37.4 percent as compared with 15 percent when nicotinic acid was given over the same period. Vasodilatation, which had occurred in all cases during previous nicotinic acid trials, did not appear in six cases. In those cases where it was present the flushing was not so pronounced. A mild eosinophilia was found in six of seven cases given two weeks medication. Gastrointestinal disturbances occurred in four cases. Nicospan, as described by P. O'Reilly in *Canad. M. A. J.* 80:359 (Mar. 1) 1959, was supplied by Wm. Merrell Company.

SYLVIA SCHMIDT

Sulfaphenazol—Long Acting Sulfonamide

Sulfaphenazol, N'-(1-phenyl-5-pyrazolyl)-sulfanilamide, is a new antibacterial sulfonamide that is rapidly absorbed and slowly excreted. In the treatment of animal and a limited number of human infections, the drug has been shown to be comparable therapeutically to other systemically employed sulfonamide drugs. Comparative studies of nine patients reported by William Boger in *J. Am. Geriat. Soc.* 7:314 (Apr.), 1959 show that sulfaphenazol produced plasma concentrations intermediate between those of sulfisoxazole and sulfamethoxypyridazine following single two gram oral doses. Plasma concentrations are maintained above 10 mg. per 100 ml. for at least 24 hours. About 21 percent of an administered dose is recovered in the urine within eight hours with approximately 30 percent of the drug appearing in the conjugated form. Differential solubility between the conjugated compound and the parent drug is not a problem, since both forms are equally soluble. Sulfaphenazol apparently does not diffuse through uninflamed meninges into the cerebrospinal fluid. The approximate renal clearance of sulfaphenazol is between 1.03 and 1.79 ml. per minute. No evidences of toxicity were observed. The characteristics of sulfaphenazol permit a widely spaced oral dosage for the treatment of infections that are amenable to sulfonamide medication. Sulfaphenazol was supplied by Ciba Pharmaceutical Products Inc. as Orisul.

SYLVIA SCHMIDT

Topical Therapy With Chlorquinaldol and Hydrocortisone

Studies made with chlorquinaldol alone and in combination with hydrocortisone showed that a three percent preparation of chlorquinaldol was effective in 60 percent of 170 patients with eczematized dermatoses as well as bacterial and fungal infections of the skin. The combination of chlorquinaldol and 1 percent hydrocortisone had an effectiveness of 82 percent with 203 patients being treated. Further studies were made using 0.5 percent hydrocortisone in the combination and the results showed this combination to be superior to chlorquinaldol alone and equal to 1 percent hydrocortisone. Fox did this study and results were reported in *Antibiot. Med. and Clin. Ther.* 7:85 (Feb.) 59. Irritations occurred in only 3 of 289 patients treated with the combinations of chlorquinaldol and hydrocortisone. The tests showed the combinations to be favorable in a variety of dermatological disorders. The material for this study was supplied by Geigy Chemical Corporation.

RICHARD H. HARRISON

Comparison of Oxymorphone and Morphine

Oxymorphone was compared with morphine and placebo in the same patients for its effectiveness against chronic pain due to neoplastic disease. The tests conducted by Eddy and Lee show that 1.02

mg. of oxymorphone was equivalent to 10 mg. of morphine sulfate. At this dosage there was no substantial difference in onset or duration of action. The side effects of oxymorphone in equipotent analgesic doses were slightly lower, but an increase of the dose of oxymorphone increased the side effects. These side effects were severe respiratory depression in debilitated individuals, possibly to a greater extent than with morphine. The results were reported in *J. Pharmacol. and Exptl. Ther.* 125:116 (Feb.) 1959. Oxymorphone was supplied by Endo Laboratories.

RICHARD H. HARRISON

Cycloserine as an Antidepressant

Cycloserine, an antituberculus drug, has been known to cause convulsions and to aggravate psychosis. This study was made to determine its antidepressant effect. The study, made by Crane, was reported in *Amer. J. Psychiatry 115*:1025 (May) 1959. Thirty-seven patients were treated in the study. These patients were remaining from two larger original groups of patients in this study; some of which were discontinued for various reasons. The average daily dose was 500 to 2000 mg. in the first group. The second group daily dosage was 500 to 750 mg. Twenty-seven patients showed a substantial improvement of a psychological nature, three a partial improvement and seven showed no change or were worse. The tests showed some neurological side effects of dizziness, fogginess, excessive sleep, convulsions, overactivity and psychotic reactions. Dermatitis with hair loss and dysmenorrhea were the only non-neuropsychotic side effects noted. The drug supplied as Seromycin by Lilly has a potential use as a valuable tool in psychopharmacological research and may be helpful therapeutically in doses of 500 mg. daily and less. The patient may also require more than average supervision.

RICHARD H. HARRISON

Fluphenazine—Antipsychotic

Fluphenazine, the trifluoromethyl homologue of perphenazine, was used in 110 hospitalized patients and appears to be an efficacious antipsychotic agent for both acute and chronic cases. It is particularly advantageous in that it does not ordinarily produce any excessive flattening of affect, nor does it produce any great amount of akathisia. In most patients, adequate therapeutic dosages may be given, and in some cases these doses have been very high. The use of the injectible form has been fast and effective. Extrapyramidal symptoms were frequent but were controllable in most cases without lowering the dose below therapeutic effectiveness, or by using antiparkinsonian agents, or both. Patients who became depressed after taking this drug could not be maintained with it ordinarily. Harry Darling in *Dis. Nerv. System 20*:167 (Apr.) 1959, relates that leukopenia does occur. The drug is sympathicolytic in action. Therapeutic effectiveness, milligram per milligram, is at least 25 times that of chlorpromazine, or even more. Fluphenazine used in this study was supplied by the E. E. Squibb & Sons as Prolixine.

SYLVIA SCHMIDT

Treatment of Amebic Dysentery with Paromomycin

Paromomycin Escherichia is a new antibiotic which has exhibited broad spectrum activity both *in vitro* and against experimental infections in animals. *In vitro* activity was noted against *Salmonella, Shigella, Escherichia coli, Proteus, Aerobacter* and *Staphylococci.* Tests showed the drug to be as efficient, and in some cases more efficient, than equal concentrations of some known antibiotics such as erythromycin, chloramphenicol, tetracycline, or neomycin. Tests were made in 20 cases of intestinal amebiasis and the results reported in *Antibiot. Med. Clin. Therap. 6*:275 (May) 1959, by Shafei. In the twenty cases in which the drug was used, it showed marked activity against *Entomoeba histolyticus.* The dosage was 20 mg./Kg. per day, for seven days. The drug, supplied as Humatin by Parke, Davis and Company, was effective in curing 70 percent of the cases treated. These cases were followed up for three months. No side effects were noted at the dosage used.

RICHARD H. HARRISON

Puromycin—Intestinal Amebiasis

Puromycin is a new antibiotic derived from the fermentation of *Streptomyces alboniger.* Its molecule consists of a purine, an amino sugar, and an amino acid. Aly Shafei in *Antibiot. Med. Clin. Therap. 6*:279 (May) 1959, reports the results of treating 24 cases of amebic dysentery with puromycin alone or in combination with phthalylsulfathiazole. Puromycin, in doses of 1.0 gram daily for 14 days, proved to be comparable in action to fumagillin and cured 64 percent of cases within the observation period of 3 months. When puromycin was combined with phthalyl sulfathiazole in doses of 3.0 gram daily during the whole course of treatment, the relapse rate was reduced from 34.3 percent to 16 percent. Such a combination also increased the efficiency of puromycin for patients with acute amebic dysentery. On the other hand, puromycin proved ineffective for the treatment of hepatic amebiasis. No serious toxic effects were noticed. Puromycin was supplied by Lederle Laboratories as Stylomycin.

SYLVIA SCHMIDT

Timely Drugs

Atratan

CHEMICAL NAME: Atropine tannate (Tantropin), containing about 44.45% atropine base; 1 mg. of atropine tannate is equivalent to 0.53 mg. atropine sulfate.
INDICATIONS: Smooth muscle spasm especially of the urinary tract (renal and ureteral).
SIDE EFFECTS AND CONTRAINDICATIONS: Glaucoma.
DOSAGE: 1 mg. (of tannate) every 4 hours.
PREPARATIONS: Tablets containing 1 mg. atropine tannate.
PACKAGING: Bottles of 50 tablets.
SUPPLIER: Irwin, Neisler & Co.

Chymar Ointment

COMPOSITION: A concentrate of pancreatic enzymes (chymotrypsin and trypsin), neomycin palmitate, and hydrocortamate hydrochloride.
INDICATIONS: Contact dermatitis, infectious dermatitis, seborrheic dermatitis, etc.; cuts and abrasions; otitis externa; and other dermatologic conditions.
SIDE EFFECTS AND CONTRAINDICATIONS: Not to be used as an ophthalmic ointment.
DOSAGE: Topically, apply directly to wound one to three times daily and cover with gauze; in otitis externa, place ointment in external canal, insert cotton, remove after 24 hours and rinse canal.
PREPARATIONS: Water-miscible base containing in each gram: a proteolytic activity of 10,000 Armour units provided by a concentrate of the pancreatic enzymes chymotrypsin and trypsin, 3.5 mg. neomycin palmitate, and 1.25 mg. hydrocortamate hydrochloride.
PACKAGING: Tubes of 5 and 15 Gm.
SUPPLIER: Armour Pharmaceutical Co.

Neptazane

GENERIC AND CHEMICAL NAMES: Methazolamide; 5-acetylimino-4-methyl-Δ^2-1,3,4-thiadiazoline-2-sulfonamide.
INDICATIONS: A carbonic anhydrase inhibitor similar to acetazolamide; indicated in treatment of glaucoma.
DOSAGE: From 50 to 100 mg. 2 to 3 times daily.
PREPARATIONS: Tablets, scored, 50 mg.
PACKAGING: Bottles of 100 Tablets.
SUPPLIER: Lederle Laboratories.

Numorphan

GENERIC AND CHEMICAL NAMES: Oxymorphone; levo-14-hydroxydihydromorphinone hydrochloride.
INDICATIONS: Analgesic in all instances of pain where morphine and morphine-like synthetic agents may be used.
SIDE EFFECTS AND CONTRAINDICATIONS: May be habit-forming.
DOSAGE: Subcutaneously and intramuscularly, 1.5 mg. every 4 to 6 hours; rectally, 2 mg. or 5 mg. inserted every 4 to 6 hours.
PREPARATIONS: Injection, 1.5 mg. oxymorphone per ml.; rectal suppositories, 2 mg. and 5 mg.
PACKAGING: Injection, 1 and 2 ml. ampuls and 10 ml. vials; suppositories.
SUPPLIER: Endo Laboratories.

Polybrene

GENERIC NAME: Hexadimethrine bromide.
INDICATIONS: Antiheparin agent wherever heparin is to be neutralized, i.e., after cardiac and isolated perfusion surgery involving extracorporeal circulation, after accidental heparin overdosage, when emergency surgery is necessary in a heparinized patient, and if trauma causes hemorrhage in patient on heparin therapy.
SIDE EFFECTS AND CONTRAINDICATIONS: Special care should be taken in patients with impaired cardiovascular or respiratory function.
DOSAGE: Dilute Polybrene with isotonic saline or 5 percent dextrose in water to give a final concentration of 1 mg. per ml.; administer 1 mg. for each 100 U.S.P. units of heparin over a 10 to 15 minute period; repeat if necessary.
PREPARATIONS: 10 ml. ampuls.
PACKAGING: Cartons of 5 or 25 ampuls.
SUPPLIER: Abbott Laboratories.

Solu-Medrol

GENERIC NAME: Methylprednisolone sodium succinate.
INDICATIONS: In situations in which a rapid and intense hormonal effect is required; also, in conjunction with appropriate antibacterial therapy in overwhelming infections with severe toxicity; as a useful adjunct in treatment of patients with ulcerative colitis.
DOSAGE: Depending upon severity of condition, 10 to 40 mg. administered intravenously over a period of 60 seconds to several minutes; subsequent doses may be given intramuscularly or intravenously every 6 to 24 hours; in ulcerative colitis, it is instilled into the colon in retention enemas or by continuous drip.
PREPARATIONS: Mix-O-Vial containing 40 mg. methylprednisolone sodium succinate with lactose, with 1 ml. Water for Injection.
PACKAGING: 1 ml. Mix-O-Vials.
SUPPLIER: Upjohn Co.

Stelazine Concentrate

GENERIC NAME: Trifluoperazine.
INDICATIONS: Antipsychotic agent, available in concentrate form to assure drug ingestion in patients resistant to medication and in patients too ill to swallow tablets.
DOSAGE: Initially, 2 mg. two or three times daily.
PREPARATIONS: Liquid containing 10 mg. trifluoperazine per ml.
PACKAGING: Bottles of 2 ounce with dropper graduated in units of 2, 5, and 10 mg.; in cartons of 4 and 12 bottles.
SUPPLIER: Smith Kline & French Laboratories.

Tenuate

CHEMICAL NAME: Diethylpropion; 1 phenyl-2-diethylaminopropanone-1-hydrochloride.
INDICATIONS: Anorexient indicated in obesity, particularly where it complicates the treatment of cardiovascular disease, diabetes or pregnancy.
SIDE EFFECTS AND CONTRAINDICATIONS: Dryness of the mouth and thirst rarely; occasionally, constipation.
DOSAGE: 25 mg. three times daily one hour before meals.
PREPARATIONS: Tablets containing 25 mg.
PACKAGING: Bottles of 100 and 1,000 tablets.
SUPPLIER: Wm. S. Merrell.

THE LAW
of hospital pharmacy

edited by GEORGE F. ARCHAMBAULT

► WITH THE INCREASE INTEREST on the part of boards of pharmacy and hospital pharmacists in methods of regulating the practice of pharmacy in hospitals, it may be helpful to note how a selected group of states handle this somewhat complex problem. From time to time, we will publish regulations of the various states as they apply to hospital practice.

The following ruling of the Michigan Board of Pharmacy, O. K. Grettenberger, Director, appeared in the Volume II, Number 12, 1958, of the *N.A.B.P. Bulletin.*

Michigan Hospital Rule

► ALL HOSPITAL PHARMACIES in the State of Michigan are required to obtain a license from the Board of Pharmacy to operate. Authority is granted the Board through statutes which enable them to make rules and regulations not inconsistent with the law, a clause which is found in all pharmacy laws. Some time ago an Attorney General's opinion dated January 27, 1956, together with an earlier opinion, dated March 13, 1946 gave the Board legal interpretations to promulgate Rule 32 "Requirements for Hospital Pharmacies." Rule 32 was reported in the October, November, December 1956 issue of the Bulletin and provides for control of all compounding and dispensing of drugs issued in hospitals. It states that these acts shall be under the supervision of a registered pharmacist on a full time or part time basis. Also provided is the licensing of all hospital pharmacies by the State Board and provisions for the pharmacist in charge to initiate rules, regulations and procedures for handling drugs by hospital personnel with the approval of the director of the hospital. Such rules shall conform to state and federal law concerning narcotics, barbiturates and other prescribed drugs. Rule 32 also makes provisions for the procurement of drugs by nurses, under orders, of medication previously prepared by a pharmacist.

Over 300 hospitals have been licensed by the Board with most hospital pharmacies employing one or more full time pharmacists. Small hospitals have engaged the services of pharmacists on a part time basis who performs his duties to adequately dispense all medication from the pharmacy to procurement containers or stations and to provide advice and consultation in handling of drugs and medicines to afford adequate protection to the patients within the hospital.

Rule 32 also states that any hospital unable to secure pharmaceutical service locally should consult with the Board of Pharmacy.

The Board has promulgated a new regulation which extends provisions of the Board's authority to regulate pharmacies and hospitals. Rule 35 "Regulations for Pharmacy Service in Michigan Hospitals" sets down provisions for the department of pharmacy in general hospitals with more than 100 beds, private hospitals with more than 100 beds, hospitals with 25 to 99 beds and hospitals with less than 25 beds. The regulation provides that pharmacies in hospitals shall maintain minimum standards as prescribed by the Board.

The new regulation is as follows:

General Hospitals With More Than 100 Beds

1. Each general hospital having 100 or more beds shall have an organized pharmacy which shall be under the supervision of a licensed pharmacist who shall be a full-time employee of the hospital.

Other Hospitals With More Than 100 Beds

2. All other hospitals having 100 or more beds shall have an organized pharmacy department which shall be under the supervision of a licensed pharmacist who shall render his services either on a full or part-time basis. Part time shall mean sufficient time spent by the pharmacist to adequately dispense all medications from the pharmacy to procurement bottles or stations and/or complete the duties necessary to provide protection to patients within the hospital or to outpatients receiving medication from the hospital to the satisfaction of the Board of Pharmacy.

Hosptials With From 25 to 99 Beds

3. Each hospital with from 25 to 99 beds, which does not have the services of a full-time pharmacist, shall have its pharmacy services under the supervision of a licensed pharmacist who shall render his services on a part-time basis. Part time is construed to mean the same as in paragraph 2.

Hospitals With Less Than 25 Beds

4. Each hospital of less than 25 beds may employ a part-time pharmacist who is employed in the immediate vicinity, and who shall have full authority and responsibility in the handling of drugs in designated hospital.

Minimum Standard for Pharmacies In Hospitals

5. Pharmacy service in hospitals shall be rendered in accordance with the Minimum Standard for Pharmacies in Hospitals as established by the Michigan Board of Pharmacy.

Virginia Regulations

►THE FOLLOWING HOSPITAL PHARMACY regulations of the Commonwealth of Virginia were presented at a public hearing held by the State Board of Pharmacy in Richmond on February 2, 1959.

Permits Registering Pharmacies, Paragraph 9—Hospital Pharmacies

(a) All hospitals providing pharmaceutical service shall be registered with the State Board of Pharmacy, and such registration shall be renewed annually.

(b) "Pharmaceutical Service" shall be construed to be the preparing, compounding, processing, repacking or dispensing of drugs, medicine, poisons or other (related) items as designated by the Board of Pharmacy.

(c) The services of the hospital pharmacy shall be under the general supervision of a pharmacist, either on a full-time, part-time, or consulting basis, except that procedures requiring the compounding, manufacturing, packaging or processing of drugs, shall be under the immediate supervision of a pharmacist. The Board may determine the type of supervision necessary, if required.

(d) All drugs and medications furnished to outpatients or discharge patients shall be dispensed by or under the supervision of a pharmacist and such medication must be properly labeled as required by law.

(e) These regulations shall not preclude nurses or other authorized personnel from procuring from the pharmacy, in order to carry out physicians orders, those drugs which have been received, compounded, labeled, dispensed or prepared for administration by or under the supervision of a pharmacist, or original packages put up by a manufacturer, wholesaler, or registered pharmacist. These items may be procured by authorized personnel under rules and procedures approved by the pharmacist in charge or (and) the Board.

(f) Effective date: January 1, 1960.

Washington

► ANOTHER SET OF REGULATIONS of interest are the "Standards Governing Hospital Pharmacy During the Absence of the Pharmacist" of the State of Washington. This set of regulations is, in my opinion, one of the finest in as much as it recognizes the needs of the hospitalized and the distinction between drug dispensing (A Pharmacy Act) and drug administration (A Nursing Act). See article entitled "The Legal Responsibility of the Hospital Pharmacist in the United States," appearing in AM. J. HOSP. PHARM. 16:105 (Mar.) 1959.

The Washington regulations follows:

1.24. No. 15. In a pharmacist's absence from a hospital, a registered nurse designated by the hospital may obtain from a hospital pharmacy such drugs as are needed in an emergency, not available in floor supplies, (excepting narcotics and barbituates), and the nurse, not the pharmacist, becomes accountable for her actions. Only one registered, professional nurse in any given eight-hour shift may have access to the pharmacy. A registered nurse is not permitted to compound or dispense drugs.

A nurse may remove from the pharmacy:

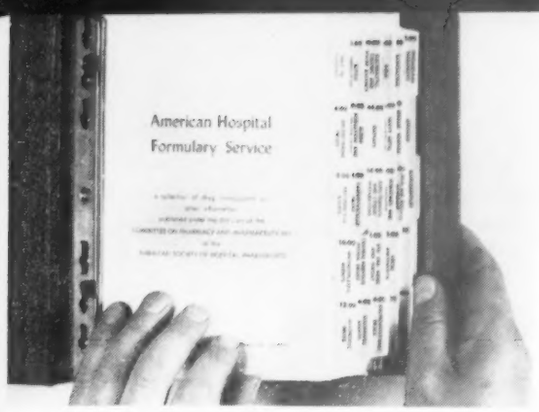
1. A drug in its original container or a drug prepackaged by a hospital pharmacist for nursing service use in the hospital.

2. A single dose of a drug from the original container for a specific patient.

A nurse shall leave in the pharmacy on a suitable form a record of any drugs removed showing:

1. The name of the drug.
2. The name of the manufacturer.
3. The dosage size.
4. The amount taken.
5. The date.
6. The time.
7. The signature of the nurse.

Further, she shall leave with the record the container from which the single dose was taken for drug administration purposes in order that it may be properly checked by a pharmacist. Such records shall be kept for three years.



AMERICAN HOSPITAL FORMULARY SERVICE

edited by WILLIAM HELLER, *Chairman ASHP Committee on Pharmacy and Pharmaceuticals*

This column is being inaugurated to keep the members of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS *and the subscribers to the American Hospital Formulary Service aware of the activities of their important new Service. We expect to include announcements concerning the Service and observations on the value and operation of the formulary system in hospitals. Helpful notes and suggestions on the utilization of the Service, as submitted by subscribers, will be passed along.*

► THE FIRST SUPPLEMENT to the AHFS was distributed in the latter part of July. Supplements will ordinarily contain both monographs of new drugs and revisions of old monographs. The first supplement contained only new monographs.

Following is the introduction to the Supplementary Index being distributed with the first supplement:

Supplementary Index

Guide to Use

The Supplementary Index is distributed with the supplements published by the American Hospital Formulary Service. Thus the Index and the Supplementary Index need to be consulted when searching for a name alphabetically. *See also* the Guide to Use of the Index.

The AHFS Supplementary Index is cumulative. As supplements are received, the monographs should be inserted alphabetically in the proper category in the hospital formulary or filed away for possible future use. The previous Supplementary Index should be discarded and the current Supplementary Index inserted. From time to time, names in the Supplementary Index will be incorporated into the Index. Monographs are revised from time to time and the latest monograph should be the only monograph included. Refer to the copyright statement to determine the date of publication.

It should be noted that listing of a drug in the Index or the Supplementary Index indicates only that a monograph for that drug has been prepared by the American Hospital Formulary Service. Subscribing hospitals may check or underline in the Indexes the names of those drugs which have been selected for inclusion in their hospital formulary.

Supplements will not be published at regular intervals. Rather they will be distributed, as they are completed, in 16-sheet or 32-sheet (32 or 64-page) groups. Such groupings will be more economical to print and will more nearly reflect the incidence of introduction of new drugs. Monographs now in process include:

12:08 ispropamide (Darbid)
12:12 mephentermine sulfate (Wyamine Sulfate)
12:12 pseudoephedrine hydrochloride (Sudafed)
28:16 chlormethazanone (Trancopal)
28:24 methitural (Neraval)
68:04 dexamethasone (hexadecron; Decadron; Deronil)
68:08 norethandrolone (Nilevar)
68:20 chlorpropamide (Diabinese)
68:32 norethynodrel
84:08 trimeprazine (Temaril)

The American Hospital Formulary Service was first made available by the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS early in 1959. Designed to assist hospitals materially in the promotion of better patient care through improved drug therapy, the Service is being used in hospitals throughout the nation.

To date, the initial volume and Supplement I have been distributed to subscribers. As originally distributed, the Formulary Service contains more than 1,500 pages and includes a total of 605 drug monographs listing 1,667 drug preparations. From these and the Supplements which will be issued periodically, Pharmacy and Therapeutics Committees in hospitals are encouraged to select those monographs to be included in their individual hospital formularies.

The American Hospital Formulary Service may be ordered from the Hamilton Press, Hamilton, Illinois, at $15.00 per copy. Extra copies of the binder are available at $4.00 each and blank pages for use in connection with preparing monographs not available, may be ordered in quantities of one ream (500 sheets) at $3.00 or two reams (1,000 sheets) at $5.40.

Suggestions or questions with regard to monographs or content of the Formulary Service may be directed to Dr. William Heller, Chairman, Committee on Pharmacy and Pharmaceuticals, Pharmacy Department, University of Arkansas Medical Center, Little Rock, Arkansas.

News

Jack Heard Named Vice-President, 1959-1960 Term

Jack S. Heard

Jack Heard, Chief Pharmacist at the University of California Medical Center in Los Angeles, has been named Vice-President of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS for the 1959-1960 term. This office, filled by action of the Executive Committee, was taken in order to fill the vacancy created when Mr. Vernon Trygstad was named President for the 1959-1960 term. Mr. Heard, as an Officer of the SOCIETY, will also serve as a member of the Executive Committee during the 1959-1960 term.

Mr. Heard brings to the SOCIETY a wealth of experience in hospital pharmacists' organizations, having served as President of both the Northern California Society and the Southern California Society of Hospital Pharmacists. He has been active in both of these groups over a period of years and, in 1958, he served as Chairman of the Local Hospital Pharmacists' Committee in connection with the Annual Meeting in Los Angeles.

In the national organization, he has served on the Committee on Program and Public Relations, the Committee on Pharmacy Operated Central Supply, and the Committee on Isotopes.

Prior to accepting his present position at the University of California Medical Center, Mr. Heard served in the U. S. Army Medical Service Corps in World War II and was a Staff Pharmacist for four years at the University of California Medical Center in San Francisco, and Chief Pharmacist for four years at Children's Hospital in San Francisco.

AHA and ASHP Approve Joint Committee Recommendations

The Board of Trustees of the American Hospital Association and the Executive Committee of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS have recently approved two recommendations made by the Joint Committee of the AHA and the ASHP. These include a recommendation to produce a career film on hospital pharmacy and a recommendation to urge state hospital associations and state hospital pharmacy societies to establish liaison committees. For the information of ASHP members, the recommendations are printed in full below.

Career Film

To produce a career film on hospital pharmacy as a means of attracting individuals to this profession in an effort to fulfill the need for additional personnel; further

To request the director to seek funds from an appropriate source so that no expense will be incurred by either the American Hospital Association or the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, and further,

To designate the Joint Committee of the American Hospital Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS as the advisory body in the production of such a film.

State Association Liaison Committees

To urge state hospital associations and state hospital pharmacy societies to establish liaison committees to consider all matters of mutual interest and concern; further

To suggest to secretaries of state hospital associations and state hospital pharmacy societies that a careful examination be made of laws which regulate the operation of hospital pharmacies in their respective states, and rules and regulations of the state board of pharmacy or other appropriate agencies, and further,

To encourage liaison committees of hospital administrators and hospital pharmacists to establish cooperative and friendly relationships and suitable means of communication with the state board of pharmacy or other appropriate agencies, if deemed necessary.

Pharmacy Section in "Hospitals"

Hospitals, Journal of the American Hospital Association, has inaugurated an editorial department devoted exclusively to hospital pharmacy. This department begins with the June 1, 1959 issue and a regular feature is scheduled for the first issue of each month.

The first article entitled, "Evolution of the Hospital Pharmacy," is by Dr. Robert Cadmus, Director of North Carolina Memorial Hospital and Professor of Hospital Administration at the University of North Carolina, Chapel Hill. Dr. Cadmus is well known to hospital pharmacists having served on the Committee on Pharmacy and more recently on the Joint Committee of the American Hospital Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS .

In the article, the author traces the development of the hospital pharmacy, noting the influences of the formation of a *Minimum Standard for Pharmacies in Hospitals* and the rapid and continuing growth in the use of drugs in the care of patients.

Internship Announced

The University of California Hospital at Los Angeles offers an internship program in hospital pharmacy in cooperation with the University of Southern California School of Pharmacy. The program leads to a degree of Master of Science in Hospital Pharmacy and takes from one to two years to complete the requirements.

There will be openings for two interns beginning September 1, 1959. The intern is rotated through

all phases of the Pharmaceutical Service, including Inpatient, Outpatient, Manufacturing, Sterile Solutions, and Pharmacy Administration. There is also opportunity to attend conferences, lectures, and seminars with medical and pharmacy personnel. For further information write Mr. Jack S. Heard, Chief Pharmacist, University of California Hospital, Los Angeles 24, California.

Justin L. Powers to Receive 1959 Remington Medal

Justin L. Powers

Justin Lawrence Powers, Director of Revision of the National Formulary and Editor of the Scientific Edition of the *Journal of the American Pharmaceutical Association,* has been selected by the past presidents of the American Pharmaceutical Association to become the 36th recipient of the Remington Honor Medal. This medal was established by the New York Branch of the A.Ph.A. in 1918, to be presented annually to the individual who has done most for American pharmacy in the previous year, or whose continued contributions to the advancement of pharmacy over a period of years have been most outstanding. The Jury of Award consists of the 22 past presidents of the American Pharmaceutical Association.

The 1959 award of the Remington Honor Medal was announced by Dr. Hugo H. Schaefer, Secretary of the Remington Medical Award Committee, who stated that the basis of the award was the long service which Dr. Powers has given as Chairman of the Committee on National Formulary and Director of Revision of this important official compendium. It is expected that the award will be made at a dinner to be held in New York City sometime in the early part of December, 1959.

Dr. Powers has given long and distinguished service to the development of drug standards, both national and international. He is also the Editor of *Drug Standards,* a bi-monthly publication recording progress in the development of standards for new and established drugs. He has also been instrumental in developing the high character of the Scientific Edition of the *Journal of the American Pharmaceutical Association,* a leading publication in the field of pharmaceutical science.

Dr. Powers will retire as Director of Revision of the National Formulary and Editor of the Scientific Edition of the *Journal of the American Pharmaceutical Association* in December, 1960. The award of the Remington Honor Medal therefore comes to him at a period in his career which marks the completion of *National Formulary XI,* which will undoubtedly be the most outstanding of the eleven volumes of this respected and widely used American standard for drugs under the Federal and State Food, Drug and Cosmetic laws.

Physicians' Private Offices at Hospitals

Physicians will have private offices in more nonprofit community hospitals in the future predicts a new monograph published by the American Hospital Association.

The monograph, "Physicians' Private Offices at Hospitals," is the report of a research project conducted by Dr. C. Rufus Rorem, Executive Director of the Hospital Council of Philadelphia and supported by a research grant from the Division of Hospital and Medical Facilities, U. S. Public Health Service.

The monograph states that physicians' offices in hospitals will enable patients to use the hospital as a one-stop center and "achieve convenience and effectiveness in medical practice."

"The doctor remains at one location throughout the entire day. He may interrupt his office practice for emergencies in the hospital and he avoids the necessity of traveling to and from the hospital," it points out.

"Doctors' offices at hospitals are a logical development of specialization in medical practice," according to this report. "The doctors provide the professional knowledge and skill. The community provides the funds for buildings and diagnostic and treatment facilities."

Areas investigated for the project include the types of private offices, the legal aspects, rental rates and policies, and lease provisions.

Copies of this monograph are available for two dollars each from the American Hospital Association.

American College of Apothecaries Meet

The American College of Apothecaries held its Annual Meeting at the Roosevelt Hotel in New Orleans, Louisiana, on May 17-19. A number of hospital pharmacists and members of the ASHP were present.

Of particular note to hospital pharmacists was a presentation on "Current Trends in Outpatient Prescription Business," by Grover C. Bowles, Chief Pharmacist at Baptist Memorial Hospital in Memphis, Tenn. Following the discussion, there was a question and answer period during which Mr. Bowles was called upon to comment on several other phases of hospital pharmacy practice.

Mr. Frank Kunkel, Chairman of the A.C.A.'s Hospital Committee, presented his annual report in which he commended Berman and Zugich for their fine work in preparation of the manual entitled "Pharmacy Service in Small Hospitals." Appreciation was also

expressed to the Joint Committee of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS and the American Hospital Association for its recent statement on "Suggested Principles of Relationship Between Smaller Hospitals and Part-Time Pharmacists Who Provide Pharmaceutical Services." He also expressed a desire on the part of the A.C.A. to give assistance in this area.

A meeting of the A.C.A. Hospital Committee was also held, with Mr. Frank Kunkel and Mr. Thomas Madden representing the retail field and Sister Mary Teresa and Mr. Robert Lantos representing hospital pharmacy.

Among the resolutions passed at the A.C.A. Annual Meeting, the following are of particular interest to hospital pharmacy:

Whereas, the dispensing of prescriptions to outpatients by hospitals enjoying special tax or economic status represents unfair competition to the retail pharmacy, be it therefore

Resolved, that the American College of Apothecaries petition and request that the American Hospital Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS discontinue the practice of supplying prescriptions to outpatients in the pharmacies of hospitals.

Whereas, many hospitals do not employ a pharmacist and lack adequate working agreements with local pharmacists to supply such service, and

Whereas, hospital patients are entitled to the same protection that is provided by State Law regulating the supplying of medication, as any other resident of the State, therefore be it

Resolved, that the American Hospital Association be urged to withhold its approval from such hospitals.

Whereas, the delegation of the dispensing of drugs to a nurse or office assistant or nursing home personnel, violates the provision of the Law that requires medication to be prepared or dispensed by properly trained personnel, therefore be it

Resolved, that the various State Boards of Pharmacy be urged to make it obligatory that the dispensing of medication by physicians shall be performed by the physician personally.

► HOSPITAL PHARMACISTS PARTICIPATING in the Seventy-fifth Annual Convention of the Michigan State Pharmaceutical Association included Mrs. Jane Rogan, Chief Pharmacist, Evangelical Deaconess Hospital, Detroit; Mr. Ed Superstine, Chief Pharmacist, Metropolitan Hospital, Detroit; and Dr. Don E. Francke, Director of Pharmacy Service, University Hospital, Ann Arbor.

During the Convention, Mrs. Jane Rogan was honored by the Michigan State Pharmaceutical Association for her outstanding contributions to the profession.

Exhibit sponsored by Division of Hospital Pharmacy at Catholic Hospital Association in May. Those assisting at the booth are Norman Hammelman, St. Louis; Paul Parker, Washington; and Kurt Kleinmann, St. Louis.

SELECTED PHARMACEUTICAL ABSTRACTS

and summaries of other articles interesting to hospital pharmacists

edited by CLIFTON J. LATIOLAIS, HENRY J. DEREWICZ *and* LEO F. GODLEY

SULFA-SOLUBILITY

The Solubility of Various Sulfonamides Employed in Urinary Tract Infections, Bandelin, F. J. and Malesh, W., J. Am. Pharm. Assoc., Sci. Ed. 48:177 (Mar.) 1959. (Research Laboratories, Flint, Eaton and Company, Decatur, Ill.)

The solubilities of sulfonamides commonly employed in the therapy of urinary tract infections and their N^4 acetyl derivatives have been investigated in phosphate buffers and in a synthetic urine known as Mosher's Vehicle over the pH range 4.5 to 7.0 at 37°. All compounds increased in solubility with increasing pH and all had similar curve characteristics. Of the compounds investigated, sulfacetamide exhibited the greatest solubility, followed in decreasing order by sulfaethylthiadiazole, sulfamethylthiazole, sulfisoxazole, and the trisulfapyrimidines. The solubility characteristics of sulfamethoxypyridazine were found to differ from the other compounds of this group. The N^4 acetyl derivatives exhibited solubility curves similar to those of the parent compound but were generally less soluble in the media employed, with the exception of the combined trisulfapyrimidine acetyl derivatives. As a general rule, both the sulfonamides and their acetyl derivatives were more soluble in Mosher's Vehicle than in the phosphate buffers. Comparison of solubility data is made and details of the experimental methods given.

AUTHOR'S SUMMARY

HOSPITAL PHARMACISTS IN RESEARCH

Research in Hospital Pharmacy, Stauffer, I., Hosp. Pharm. (Canada) 12:17 (Jan.-Feb.) 1959. (University of Toronto, Toronto, Ontario, Canada.)

The author indicates that research in hospital pharmacy has now become a reality which must be encouraged and expanded. In describing the type of research that may be done by hospital pharmacists, the author emphasizes that basic research and planned research are not feasible for hospital pharmacists because of economic, time and training factors. However, recent surveys visualize the hospital pharmacist as part of a team in "operational research" in health studies. Much of the past work done by hospital pharmacists has dealt with equipment testing, stability of pharmaceutical preparations, sterilization techniques and product formulations. Most of this work is best classified as product development and is not looked upon as research. Because of the great and increasing demand for pharmacy service in hospitals today, the average pharmacist can best approach research activities by participating in clinical investigation work being conducted in the hospital through the Pharmacy and Therapeutics Committee. Also, cooperation in research can be arranged in departments such as pathology and bacteriology. "Operational research" can be conducted jointly with the administrative departments of the hospital. Mention is also made of research opportunities which may be developed in internship programs.

HENRY J. DEREWICZ

SOLUBILIZING VITAMINS A AND D_2

Pharmaceutical Preparations VIII. Solubilization of Vitamin A and D_2 4. Required Hydrophile - lipophile Balance for Solubilization of Vitamin A and D, Mima, Hiroyuki, Yakugaku Zasshi 78:983 (1958).

The kind and amount of surface active agent required to solubilize vitamin A and D_2 differ according to the structure and purity of vitamins. Examinations were made on optimal hydrophile-lipophile balance (HLB) for solubilization of various preparations of A and D_2. Mixtures of various HLB were prepared for suitable combinations of various surface active agents, these were mixed in Vitamin A or D_2 in a ratio of 1:5 to 1:10, and these mixtures were diluted with water. The optimal HLB is obtained from the relation between the transmittance of the above aqueous solution and HLB. There were some differences, even in 2 mixtures which have the same HLB, in their properties according to the different surface active agents used. When two kinds of surface active agents with greatly differing HLB are used, the range of solubilization is smaller than when agents with small difference are used. The optimal HLB for vitamin A palmitate is 14.5 - 15.5, that for vitamin A acetate is 15.8 - 16.2 and those of vitamin A alcohol and vitamin D_2 are above 17.9; these values are parallel to their lipophilic and hydrophilic properties. In general, vitamins with higher units obtained by purification have wider range of optimal HLB, and the optimal HLB becomes higher in case of vitamin A palmitate. The difference is the effect of impurities; the optimal HLB differs between synthetic and natural products.

K. KITSUTA, CHEMICAL ABSTRACTS 53:1636 d

MEPROBAMATE INJECTION, SOLVENT FOR

Glycols as Solvents for Meprobamate, Bornmann, Gerhard and Loeser, Arnold, (Uni. Munster i. Westf., Ger.) Arzneimittel Forsch. 8:276 (1958).

Propylene glycol and 1,3- butanediol are solvents for meprobamate solutions suitable for injection. The subcutaneous toxicity of both solutions is about the same, both may cause local irritation, especially during chronic appplication.

K. SCHOEV, CHEMICAL ABSTRACTS 53:1640 c

RESERPINE ORAL SOLUTION, PATENT ON

Reserpine in Liquid Oral Dosage Form, Upjohn Co. Brit. 798,074, July 16, 1958.

A stable solution with rapid physiological activity is prepared with a solvent system of ethyl alcohol, propylene glycol, sorbitol, and water with suitable flavors and a combination of caramel and F.D.C. Red No. 2 as coloring agents. The addition of ascorbic acid also aids in stabilizing the preparation. More rapid physiological activity was determined by comparing the relaxation of the nictitating membrane of dogs with that obtained by using reserpine tablets.

ROBERT F. DOERGE, CHEMICAL ABSTRACTS 53:1646 i

ASSAY OF MERCURIALS

The Microbiological Assay of Mercurials in Pharmaceutical Products. Carter, D. V. and Sykes, G., Analyst 83:536 (1958).

Organic mercurials (phenylmercuric nitrate and thiomersalate) in pharmaceutical products are determined microbiologically by a tube- or plate-dilution method using *Escherichia coli* or *Staphylococcus aureus*, respectively, after incubation at 37 deg. C. for 24 hours. The endpoint is the greatest dilution at which there is marked growth inhibition as shown by significant decrease in turbidity.

BERNARD M. BLANK, CHEMICAL ABSTRACTS 53:1629 i

ASEPTIC CASE FOR PHARMACIES

Aseptic Dispensing Suite For Pharmacies, Synek J., Ceskoslovenska farmacie (Czechoslovakia) 8:70 (Mar.) 1959.

An instruction of the Czechoslovak Ministry of Health recommends metal and glass as material for construct-

ing cases destined for aseptic work in places where aspetic conditions cannot be warranted. Such a case is to be a part of injection departments of pharmacies. As a construction of metal and glass is expensive, the author suggests one of Plexiglass which can be utilized in pharmacies for compounding sterile eye drops, preparations containing antibiotics, etc. The case is to be composed of two parts, *i.e.* bottom and covering. In the front there are two openings in which the gloves of the operator are tightly fastened. Plexiglass is resistant against the majority of disinfectants and transmits UV-light of shorter wave-lengths so that it is possible to sterilize the atmosphere of the case by means of a lamp situated outside of it.

HUBERT ZACEK

THROMBOLYTIC AGENTS, CURRENT STATUS

Current Status of Thrombolytic Agents, Neff, N. H., Am. J. Pharm. 131:7 (Jan.) 1959. (Department of Pharmacology, Philadelphia College of Pharmacy and Science, Philadelphia, Pa.)

In recent years much study has been devoted to the area of thrombolytic agents. The author reviews several of the past substances which have been employed to dissolve the fibrin network of the thrombus—streptokinase, trypsin, and chymotrypsin—and discusses their efficacy and limitations. Special attention is given newer intrinsic fibrinolytic agent, fibrinolysin (plasmin.) The nature, mode of action, and toxicity of fibrinolysin are presented and discussed in detail.

ROBERT W. MAHONEY

ULTRASONICS IN THE SYRINGE SERVICE

Ultrasonics in the Syringe Service, Bradley, T. J., Morton, I. K. and Frame, E. A., Public Pharmacist (England) 16:2 (Apr.) 1959. (Pharmaceutical Department, The Victoria Infirmary, Glasgow)

The authors conducted an investigation using ultrasonic vibrations to speed up and enhance the efficiency of routine cleaning of syringes and needles.

They found that this method caused the removal of ceramic markings on syringes. It appeared that syringes which had bonding resins were attacked at the metal/glass union by this method. The higher the temperature of the cleaning solution and the presence of organic solvents accelerated the attack rate.

High quality syringes stood up well in this cleaning method and it was found that needle sharpness was prolonged. This can mean the technique lends itself to the cleaning of surgical instruments. The authors felt that there was no need to clean a syringe by this method after each use providing it was rinsed immediately but that the needles should be treated in this manner each time.

DOUGLAS SILVERNALE

CLEANING OF GLASSWARE AND RUBBER CLOSURES

Cleaning of Glassware and Rubber Closures, Fowler, P. J., Public Pharmacist (England) 16:2 (Apr.) 1959.

The author discusses some of the major problems encountered in preparing batches of injectables and what can be done to prevent a high rejection rate.

Glassware is the first consideration and is divided into five separate operations. These are: (1) preliminary treatment to remove "soil" material; (2) soaking in a detergent solution as soon as possible to insure a container free of adhering particles; (3) brushing, which is often not necessary if the previous step was followed; (4) rinsing both the inside and outside of the container; and (5) final preparation of the injection containers such as rinsing away the tap water with distilled water.

The second consideration is rubber closures. Poor cleaning of rubber closures is the main cause of rejects of solutions for injection. He suggests filling a four liter beaker two-thirds full of sodium carbonate, 0.5% sodium hexametaphosphate and 0.5% detergent. The solution is brought to a boil and water run into the beaker to remove the contaminated solution. The process is repeated omitting the sodium carbonate and rinsed. Then again repeated, omitting the detergent and rinsed. The surface of the resulting solution should then be free of all particles. The closures are then finally rinsed in particle free distilled water.

The author concludes with a discussion of some common sources of particles and possible methods of correction.

DOUGLAS SILVERNALE

ANTIBIOTIC SENSITIVITY AND COAGULASE FORMATION

A Comparative Study of the Incidence and Detection of Coagulase Formation and the Antibiotic Sensitivity of Staphylococcus Pyrogens, Hassan, M. L., Stock, J. J. and Morrison, F. A., Canadian Pharm. J. 92:197 (Apr.) 1959. (Faculty of Pharmacy, University of British Columbia, Vancouver)

On the basis of earlier investigations that coagulase production by staphylococci was a direct indication of their pathogenicity, a survey was conducted to study the incidence of coagulase formation from clinical specimens of staphylococci and to correlate this characteristic with that of the sensitivity of the organism to nine commonly used antibiotics. The enzyme, coagulase, has the ability to hemolyze red blood cells and to ferment and coagulate Hiss's mannitol serum medium.

It was found that there exists a definite association between coagulase formation, mannitol fermentation, and pathogenicity. Furthermore, coagulase-positive strains were less susceptible to the antibiotics used than the coagulase-negative strains, with the exception of Chloromycetin and erythromycin. Of 114 coagulase-positive specimens, 111 fermented mannitol and only 27 were sensitive to all the antibiotics. Whether the coagulase-positive strains were sensitive or not to antibiotics seem to have little if any influence on the ability of these strains to produce coagulase or ferment mannitol. Strains which were sensitive to penicillin were usually sensitive to all other antibiotics tested. The results appeared to indicate that the number of antibiotic resistant staphylococcal strains isolated from a particular environment is related to the frequency of use of the antibiotic in that environment.

NORMAN HO

DETECTION AND QUANTITATIVE DETERMINATION OF LOCAL ANESTHETICS

The Identification and Determination of Some Official Local Anesthetics as Tetraphenylborates, Chatten, L. G., Pernarowski, M. and Levi, L., J. Am. Pharm. Assoc., Sci. Ed. 48:276 (May) 1959. (Food and Drug Directorate, Department of National Health and Welfare, Ottawa, Canada.)

The detection and quantitative estimation of some official local anesthetics including the hydrochlorides of butethamine, dibucaine, Naepaine, piperocaine, procaine, and tetracaine may be accomplished by formation of the tetraphenyl borates of these compounds. The reaction involves the interacting of the organic bases with sodium tetraphenylboron in aqueous citrate buffers at a pH of 6.0 with subsequent formation of the respective tetraphenylborates. The reaction offers a high degree of sensitivity, permitting not only the detection but also the quantitative estimation of these drugs. Since the ultraviolet spectra of the derivatives depends mainly on the spectral characteristics of the organic bases, infrared measurements are presented to confirm the mechanism of reaction and to illustrate the value of the IR data for identification purposes.

HENRY J. DEREWICZ

DITHRANOL (ANTHRALIN) ASSAY

Colorimetric Estimation of Dithranol, Parikh, P, Vadodaria, D., Mukheyi, S., J. Pharm. and Pharmacol. 11:314 (May 1959. (Zandu Pharmaceutical Works, Ltd., Gokhaje Road South, Bombay 28, India.)

A colorimetric assay for the parasiticide, Dithranol B.P. (Anthralin N.F.) both as an isolated compound and when incorporated in ointment basis is proposed. A solution of dithranol in glacial acetic acid, when reacted with a solution of sodium nitrite, produces an orange-yellow color. Hot glacial acetic acid is also used as an extracting medium for drugs in ointment bases. Results indicate that the common therapeutic agents which accompany the drug in ointment bases such as salicylic acid, boric acid, benzoic acid and zinc oxide did not interfere with the assay.

HENRY J. DEREWICZ

VISCOSITY OF LYSOLECITHIN SOLS

The Physical Properties of Lysolecithin and its Sols, Robinson, K., and Saunders, L., J. Pharm. and Pharmacol. 11:304 (May)

1959. (Department of Physical Chemistry, School of Pharmacy, University of London, London, W.C.1, England.)

The viscosity of pure lysolecithin sols increased approximately lineally with concentrations and had a very small negative temperature coefficient. The viscosity of the sols increased in alkaline conditions when distinct aging effects became apparent which were found to be irreversible on neutralization of the sols. The viscosities of mixed sols of lysolecithin-cholesterol, lysolecithin-triolein and lysolecithin-monostearin have also been investigated; the two former systems did not show marked viscosity changes. In contrast, the lysolecithin-monostearin sols became viscous with increasing monostearin concentration and with a rise in temperature gels were eventually formed which were stable for at least a month. Cholesterol introduced as a third component into the mixed lysolecithin-lecithin sol was found to lower the viscosity of the latter system.

AUTHOR'S SUMMARY

ASSAY FOR BARBITURIC ACID DERIVATIVES

Determination of Barbituric Acid Derivatives as Mercury Complexes, Bjorling, C. O., Berggren, A., Willman-Johnson, B., J. Pharm. and Pharmacol. 11:297 (May) 1959. (Research Laboratories, Pharmacia, Ltd., Uppsala, Sweden.)

A method for the determination of barbituric acid derivatives, including both barbiturates and hydantoins in concentration as low as 0.1 mg./ml. is offered. Basis for the assay is the precipitate which occurs between barbituric acid derivatives and mercuric ions. The precipitate is soluble in certain organic solvents and can be extracted at an optimum pH of 8-9. The amount of mercury is then determined by the addition of dithizane and is then related to the equivalent amount of barbiturate present. Results indicate few interferences.

HENRY J. DEREWICZ

SALICYLIC ACID USELESS IN ZINC OXIDE OINTMENT

Conversion of Salicylic Acid into Zinc Salicylate in Ointments Containing both Zinc Oxide and Salicylic Acid, Young, E. and Weiffenbach, N., Ned. Tijdschr. voor Geneeskunde 103 I, 603 (1959)

The combination of ammoniated mercury and salicylic acid in ointments gives rise to the formation of skin-irritating mercuric chloride. However, when ammoniated mercury is combined with Lassar's Paste (salicylic acid 2 Gm., zinc oxide 25 Gm., starch 25 Gm., white petrolatum, to make 100 Gm.), no irritation of the skin takes place. In order to find the cause of this divergency the authors carried out numerous patch test on a group of 14 patients.

The possibility that transformation of ammoniated mercury in mercuric chloride by salicylic acid is inhibited by the presence of starch could be excluded. That conversion of salicylic acid and zinc oxide in zinc salicylate takes place could be demonstrated in the following tests:

(1) Patients with a hypersensitivity towards salicylic acid showed no reactions towards a paste with salicylic acid plus excess zinc oxide;

(2) Lassar's Paste plus ammoniated mercury gave only positive tests on patients with a hypersensitivity towards ammoniated mercury.

It could be demonstrated that conversion takes place rapidly; even in freshly prepared Lassar's Paste of the above stated formula (zinc oxide in excess) free salicylic acid could not be found. The authors conclude the addition of salicylic acid to zinc oxide containing ointments or pastes is useless, as the action of the formed zinc salicylate does not differ markedly from zinc oxide.

J. WOUTER HUISMAN

PENICILLIN, TOXICITY OF

Studies on the Toxicity of Penicillin Compounds Used in Therapy, Stoklaska, Von E. and Zischka, W., Arzneimittel Forschung, 9:31 (Jan.) 1959.

The compounds of penicillin G used in protracted treatment, the diethylaminoethanol ester and the procaine salt show very low toxicity following the usual routes of application, subcutaneous or intramuscular, in the experimental animals suited for penicillin tests (mice, rats). The toxicity of the a.m. compounds is considerably lower following subcutaneous application and only slightly increased following intramuscular application compared with the toxicity of penicillin G sodium. Comparison between procaine penicillin and diethylaminoethanol penicillin shows the latter to be the more toxic of the two, following subcutaneous and intramuscular application and less toxic following intraperitoneal and intravenous application.

The mechanism underlying the toxicity of penicillin G sodium, diethylaminoethanol-benzyl penicillin and procaine penicillin differs according to the type of experimental animal and the mode of application: 1. In mice, the toxicity of penicillin, regardless of the mode of application, is due to central action dependent on the doses applied. In guinea-pigs the effect is independent of the doses applied, being due to the disturbances of the gram-positive intestinal flora with subsequent enteritis. 2. The toxicity of diethylaminoethanol-benzyl penicillin following intravenous application in mice and guinea-pigs results from the uncleaved ester. Following other routes of application, the toxicity is due to the diethylaminoethanol component in mice and the penicillin G component in guinea-pigs. 3. The procaine penicillin does not possess the same significance with regard to toxicity as the diethylaminoethanol component contained in diethylaminoethanol-benzyl penicillin.

These different mechanisms underlying toxicity—not the absence of penicillinase activity in the brain of guinea-pigs—may be regarded as the factor responsible for the special reaction or the high susceptibility of guinea-pigs toward penicillin.

AUTHOR'S SUMMARY

TABLET TESTING APPARATUS

A New Tablet Testing Apparatus, Klie, H. E., Pharm. Ind. 20:417 (1958).

A testing apparatus which combines various features for testing disintegration time, solubility, and friability of compressed, coated, and press-coated tablets is described. A pan for experimental coating of tablets is attached to the apparatus.

JOACHIM ANSCHEL, CHEMICAL ABSTRACTS 53:1629 h

CURRENT LITERATURE

. . . also calling your attention to the following articles appearing in recent hospital and pharmaceutical journals

. . . . . .

ADMINISTRATION
—Inventory

Mannino, Alfred A.: The Power of Inventory, *Hosp. Management* 88:106 (July) 1959.

EDUCATION AND TRAINING

Hamilton, H. J.; Pope, L.; and Heller, W. M.: The Outpatient Pharmacy as an *In Vivo* Prescription Laboratory for Pharmacy Students, *Am. J. Pharm. Ed.* 23:268 (Spring) 1959.

Parker, Paul F.: An Institute Program, *J. Am. Pharm. Assoc., Pract. Pharm. Ed.* 20:316 (June) 1959.

FORMULARY SERVICE

Editorial: A Bouquet for the ASHP, *Hosp. Pharm.* (Canada) 12:61 (Mar.-Apr.) 1959.

PROFESSIONAL RELATIONS

Teplitsky, Benjamin: Hospital Pharmacy as Viewed by Nursing Service, *Hosp. Progress* 40:94 (June) 1959.

STERILIZATION

Burack, David: Bacterial Destruction and Immobilization, *Am. Profess. Pharm.* 25:250 (Apr.) 1959; 25:321 (May) 1959; and 25:390 (June) 1959.

GENERAL

Archambault, George F.: Pharmacy of Tomorrow (first in series of two articles) *South. Hosp.* 27:55 (June) 1959.

Cadmus, Robert R.: Evolution of the Hospital Pharmacy, *Hospitals, J.A.H.A.* 33:52 (June 1) 1959.

DRUG EVALUATIONS

by the Council on Drugs of the American Medical Association

► THE FOLLOWING MONOGRAPHS and supplemental statements on drugs have been authorized by the Council on Drugs of the American Medical Association for publication and inclusion in *New and Nonofficial Drugs*. They are based upon the evaluation of available scientific data and reports of investigations. In order to make the material even more valuable, dosage forms and preparations of individual drugs have been added to the monographs. These dosage forms and preparations were not taken from material published in the *Journal of the American Medical Association* by the Council on Drugs; rather, they were obtained from such manufacturers' brochures, news releases, etc., which were available to us at the time of publication. An attempt has been made to make the list of dosage forms as complete as possible. However, no guarantee can be made that the list of preparations is complete and it is suggested that hospital pharmacists consult manufacturers' releases for additional dosage forms and preparations.

The issues of the *Journal of the American Medical Association* from which each monograph has been taken is noted under each monograph. Monographs in this issue of the JOURNAL include those published in the *A.M.A. Journal* for April 25 and May 9, 1959.

Notice

New and Nonofficial Drugs 1959 is now available from your local bookstore and from the publishers, J. B. Lippincott Company, Philadelphia, Pa. This 1959 edition contains monographs of drugs evaluated by the Council on Drugs of the American Medical Association and published in the Journal of the A.M.A. to January 1, 1959. The indexes listed below contain those drugs evaluated and published between December 20, 1958 and May 9, 1959.

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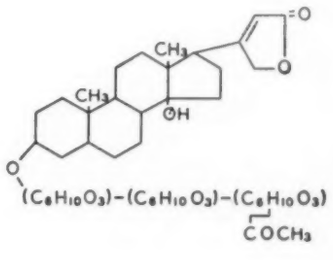
Acetyldigitoxin — Acylanid®

ACETYLDIGITOXIN (Acylanid) is the alpha acetyl ester of digitoxin.—The structural formula of acetyldigitoxin may be represented as follows:



Actions and Uses

Acetyldigitoxin, introduced in 1954, is a crystalline cardiac glycoside which is derived from lanatoside-A (a naturally occurring glycoside of Digitalis lanata) by chemically controlled, enzymatic removal of a glucose molecule. Clinically, the drug produces the therapeutic and toxic effects of digitalis and related principles. Acetyldigitoxin is characterized by a relatively rapid onset and a short duration of action as compared with digitoxin. Typical digitalis effects become discernible within two to four hours after oral administration. Because the drug is dissipated more rapidly than digitoxin, its effect is more quickly reversible; signs of intoxication disappear within one to three days after discontinuing treatment. Approximately 66% of an orally administered dose is absorbed from the gastrointestinal tract.

Acetyldigitoxin is used in the same manner as other cardiac glycosides for the treatment of congestive heart failure and/or auricular fibrillation and paroxysmal tachycardia. The drug has a high rate of fixation to serum albumin and is, therefore, well suited for maintenance treatment in chronic heart failure. Its bradycardic effect is pronounced in patients with auricular fibrillation who have a rapid heart rate. (See the general statement on digitalis and related principles in New and Nonofficial Drugs.)

Although acetyldigitoxin has shown a slightly more favorable therapeutic ration in some studies, its toxic potentialities are the same as with other digitalis preparations. As with all other cardiac glycosides, constant supervision is imperative to avoid the adverse effects of overdigitalization. Gastrointestinal symptoms, which may be expected in approximately 20% of patients despite the most careful adjustment of dosage, are indicative of excessive dosage. Such effects usually precede cardiac arrhythmias and are readily reversible upon reduction in dosage or discontinuance of medication.

Dosage

Acetyldigitoxin is administered orally for digitalization and maintenance. Since the drug is a pure glycoside, which is chemically well defined and stable, it is standardized gravimetrically rather than by biological assay. Dosage must be carefully adjusted according to the response of the individual patient and the appearance of toxic manifestations.

For rapid digitalization, 1.6 to 2.0 mg., with an average of 1.8 mg., is given within 24 hours, either as a single dose or in three or four divided doses. Some investigators have employed as much as 3.0 mg. in one day for initial digitalization, but this dose appears to be excessive from the standpoint of toxicity. For slower digitalization, daily amounts ranging from 0.6 to 1.4 mg., with an average of 1.0 mg., may be given for two to six days. Alternatively, the drug may be given in doses of 0.2 mg. three or four times daily until the therapeutic effect is achieved. The average maintenance dose of acetyldigitoxin is 0.15 mg. per day, with a range of 0.1 to 0.2 mg.

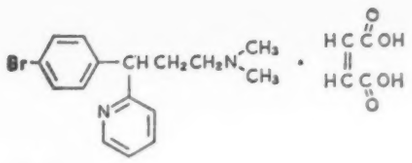
Preparations: tablets 0.1 mg. and 0.2 mg.
Sandoz Pharmaceuticals, Division of Sandoz, Inc., cooperated by furnishing scientific data to aid in the evaluation of acetyldigitoxin.
J. Am. Med. Assoc. **169**:116/2018 (Apr. 25) 1959.

Preparations

Tablets Acetyldigitoxin (Acylanid) 0.1 mg. and 0.2 mg.

Brompheniramine Maleate — Dimetane® Maleate

BROMPHENIRAMINE MALEATE (Dimetane) is 2-[*p*-bromo-*a*-(2-dimethylaminoethyl) benzyl]pyridine maleate.—The structural formula of brompheniramine maleate may be represented as follows:



Actions and Uses

Brompheniramine maleate, introduced commercially in 1958, is a potent antihistaminic agent with actions and uses similar to those of chlorpheniramine maleate, to which it is chemically related, the difference being the substitution of a bromine atom for the chlorine atom of the latter compound. (See the monograph on chlorpheniramine maleate and the general statement on histamine-antagonizing agents in New and Nonofficial Drugs.) Brompheniramine exhibits a high order of antihistaminic effectiveness and a low incidence of side-effects. Thus, it has a relatively large margin of safety. The drug is also suitable for parenteral administration.

Dosage

Brompheniramine maleate is administered orally or by subcutaneous, intramuscular, or intravenous injection. For adults, the usual oral dose is 4 mg. three to six times daily. Alternatively, a sustained release tablet containing 12 mg. may be taken every 8 to 12 hours or twice daily. For children over 6 years of age, the oral dose is one-half of that outlined for adults. Doses of 2 mg. given three times a day are usually adequate for children under 6 years of age.

For parenteral administration by the subcutaneous, intramuscular, or intravenous routes, the usual dose of brompheniramine maleate ranges from 5 to 20 mg., with an average of 10 mg. No more than 40 mg. of the drug should be given parenterally in a 24-hour period. When given intravenously, the drug should be injected slowly in a solution no more concentrated than 10 mg. per cubic centimeter. For use in reducing the danger of transfusion reactions, 10 mg. of the drug may be mixed with blood at the time of transfusion, or 10 mg. may be injected intravenously. Sterile solutions of the drug can be mixed with isotonic sodium chloride or 5% dextrose injections, but they should not be allowed to stand in contact with antigenic material used in hyposensitization procedures.

Preparations: elixir 0.4 mg. per cc.; solution (injection) 10 mg. in 1 cc., 200 mg. in 2 cc.; tablets 4 mg.; tablets (sustained release) 12 mg.
A. H. Robins Co., Inc., cooperated by furnishing scientific data to aid in the evaluation of brompheniramine maleate.
J. Am. Assoc. **170**:132/194 (May 9) 1959.

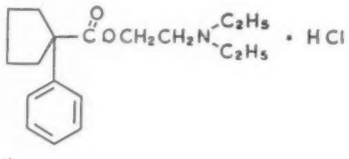
Preparations

Elixir Brompheniramine (Dimetane) Maleate 2 mg. per 5 ml.; pint bottles.
Expectorant Brompheniramine (Dimetane) Maleate 2 mg. per 5 ml., with Glyceryl Guaiacolate 100 mg. and Phenylephrine 5 mg., per 5 ml.; pint bottles.
Injection Brompheniramine (Dimetane) 10 mg. per ml., 1 ml. ampuls, and 50 mg. per ml., 2 ml. ampuls.
Tablets Brompheniramine (Dimetane) Maleate 4 mg.
Tablets, Long-Acting (Extentabs) Brompheniramine (Dimetane) Maleate 12 mg.

Caramiphen Hydrochloride

Panparnit® Hydrochloride

CARAMIPHEN HYDROCHLORIDE (Panparnit) is 2-diethylaminoethyl 1-phenylcyclopentanecarboxylate hydrochloride.—The structural formula of caramiphen hydrochloride may be represented as follows:



Actions and Uses

Caramiphen hydrochloride, introduced in 1949, is a synthetic antispasmodic agent which is used in the medical management of paralysis agitans (Parkinson's disease). It may be classified pharmacologically as an atropine-like drug. However, it has much weaker mydriatic and antisecretory effects than do the belladonna alkaloids while, at the same time, exerting a potent spasmolytic effect on smooth muscle. Caramiphen also relieves spasticity of voluntary muscle, an action believed due to peripheral cholinergic blockade plus central inhibition on cerebral motor centers.

Caramiphen is generally considered to be better suited for so-called postencephalitic Parkinsonism than for the "arteriosclerotic" or "idiopathic" types of the disease. The drug apparently has little effect on tremor but, in favorable cases, may afford some relief from rigidity. This relief is by no means complete; therapy is usually considered beneficial if muscle spasm is relieved by about 25%. As with other anti-Parkinsonian agents, there is no reliable criterion on which to predict responsiveness to caramiphen. In general, however, patients who respond well to the belladonna group of drugs will also show a favorable response to caramiphen. Although caramiphen appears to serve a useful purpose for the symptomatic treatment of some patients with paralysis agitans, it should be borne in mind that the long-term management of this disease with any therapeutic agent is unsatisfactory.

Giddiness and weakness occur frequently during the course of therapy with caramiphen. Other less frequent side-effects are chiefly atropine-like and include dryness of the mouth, blurring of vision, dizziness, faintness, and hypotension. Owing to its anticholinergic classification, caramiphen should be used cautiously, if at all, in patients with glaucoma, prostatic hypertrophy, urinary retention, or marked vegetative nervous system dysfunction.

Dosage

Caramiphen hydrochloride is administered orally. Dosage must be highly individualized according to therapeutic response and appearance of side-effects. Initial dosage should be low, and the increase gradual. Changes from other anti-Parkinsonian medication should also be gradual, without abrupt stoppage of the previously used drug. Individual doses of 12.5 mg. may be given five times on the first day, with daily increments of about 50 mg. in the total daily dose until disagreeable side-effects begin to outweigh the beneficial effects. Maintenance doses generally range from 90 to 600 mg. a day, given in divided doses at intervals of two to three hours, throughout the day.

Preparations: tablets 12.5 mg. and 50 mg.
Geigy Pharmaceuticals, Division of Geigy Chemical Corporation, cooperated by furnishing scientific data to aid in the evaluation of caramiphen hydrochloride.
***J. Am. Med. Assoc.* 169:117/2019 (Apr. 25) 1959.**

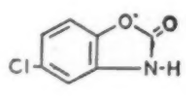
Preparations

Tablets Caramiphen (Panparnit) Hydrochloride 12.5 mg. and 50 mg.

Chlorzoxazone

Paraflex®

CHLORZOXAZONE (Paraflex) is 5-chloro-2-benzoxazolinone.—5-Chlorobenzoxazolinone.—The structural formula of chlorzoxazone may be represented as follows:



Actions and Uses

Chlorzoxazone, introduced in 1958, is a skeletal muscle relaxant with actions and uses similar to those of zoxazolamine, of which it is a derivative. Chlorzoxazone produces higher blood levels after oral administration than does zoxazolamine. It does not have the uricosuric activity exhibited by zoxazolamine. The drug is used in the same manner as zoxazolamine for the treatment of painful muscle spasm associated with certain musculoskeletal disorders. These include low back pain, fibrositis, bursitis, myositis, spondylitis, sprains, muscle strains, and torticollis. It may also be employed in conjunction with analgesics (salicylates) and other forms of therapy for the symptomatic treatment of spasm in rheumatoid arthritis and osteoarthritis. Current evidence indicates that chlorzoxazone is of the same order of effectiveness as zoxazolamine for these musculoskeletal disorders. The drug may have some limited value as an adjunct to other therapy in the management of cervical root syndrome and disk disorders. There is little evidence that chlorzoxazone is of any appreciable benefit in spasticity of neurological origin such as in cerebral palsy, dystonia musculorum, amytrophic lateral sclerosis, and multiple sclerosis. Like zoxazolamine, the drug has not been of value in paralysis agitans (Parkinson's disease), various pyramidal tract lesions, basal ganglion disorders, or epilepsy.

In general, the clinical toxicity of chlorzoxazone is less than that of zoxazolamine, which is the principal distinguishing feature between the two drugs. Side-effects, which are reversible and seldom require the discontinuance of medication, include occasional instances of nausea and vomiting, heartburn, abdominal distress, constipation, and diarrhea. Central nervous system effects may include dizziness, lightheadedness, drowsiness, overstimulation, headache, lethargy, or malaise. Although not frequent, hypersensitivity reactions of the skin may occur; the drug should be discontinued if pruritus or urticaria develops.

Dosage

Chlorzoxazone is administered orally in doses which must be individualized according to the severity of the symptoms under treatment and the response of the particular patient. For adults, dosage ranges from 250 to 750 mg. three or four times a day. Dosage for children is reduced according to age and body weight.

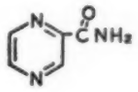
Preparations: tablets 250 mg.
McNeil Laboratories, Inc., cooperated by furnishing scientific data to aid in the evaluation of chlorzoxazone.
***J. Am. Med. Assoc.* 170:133/195 (May 9) 1959.**

Preparations

Tablets Chlorzoxazone (Paraflex) 0.25 Gm.

Pyrazinamide

PYRAZINAMIDE (Pyrazinamide). The structural formula of pyrazinamide may be represented as follows:



Actions and Uses

Pyrazinamide, introduced in 1955, is a potent, synthetic, antituberculosis agent. Its tuberculostatic activity, as indicated by its ability to eradicate viable tubercle bacilli in mice, is less than that of streptomycin or isoniazid but greater than that of aminosalicylic acid. Pyrazinamide is probably more active also than either cycloserine or viomycin.

Because of its potential toxicity and relatively short period of effectiveness, pyrazinamide is considered one of the secondary drugs for the chemotherapy of tuberculosis. It is best reserved for seriously ill hospitalized patients with tuberculosis that has ceased to respond to one or more of the major chemotherapeutic agents and combinations, i.e., strep-

tomycin, isoniazid, and aminosalicylic acid. Short-term coverage of surgical procedures to minimize or prevent the spread of infection or occurrence of other tuberculous complications is currently the chief indication for pyrazinamide. Occasionally, the drug can be used in medical emergencies for the treatment of gravely ill patients who are intolerant, by reasons of acquired allergies, to other chemotherapeutic agents. Pyrazinamide is not recommended in the initial therapy of newly discovered or previously untreated cases of tuberculosis.

When pyrazinamide is used alone, organismal resistance to its tuberculostatic action develops rapidly (within six to seven weeks), rendering further use of the drug ineffectual. For this reason, there is no indication for the long-term use of pyrazinamide alone in tuberculosis.

Since past experience shows that combined anti-infective therapy is usually superior in the treatment of tuberculosis to therapy with a single drug, the question arises as to the desirability of combining pyrazinamide with other agents. Current opinion seems to be fairly well divided on this issue. When high (and potentially toxic) doses of pyrazinamide are combined with the usual doses of isoniazid, there is some evidence to suggest a synergistic action, which may provide a higher degree and a longer period of chemotherapeutic effectiveness. Such salutary effects are not observed when the dose of pyrazinamide is low. On the contrary, there is a possibility that small amounts of pyrazinamide may even interfere with the chemotherapeutic effectiveness of isoniazid. On the basis of present evidence, the use of pyrazinamide alone, given briefly before and after operation, seems to be justified solely as a means of protecting tuberculous patients against the complications of chest surgery. The ultimate value of pyrazinamide in combination with other drugs must await the results of further investigations.

Hepatic damage, with or without jaundice, has been a serious untoward reaction which has limited the usefulness of pyrazinamide. Although signs of impaired liver function often disappear upon discontinuance of medication, the damage may be progressive and irreversible and may result in death. It is estimated that jaundice occurs in about 3 percent of patients receiving this drug and that abnormal liver function tests are demonstrated in about 10 to 15 percent of patients with or without jaundice. Hence, pyrazinamide should be used only when close observation of the patient is possible (preferably in a hospital) and when adequate facilities are available for reliable liver function tests. Sulfobromophthalein retention, serum bilirubin values, thymol turbidity or cephalin flocculation tests, and serum glutamic oxalacetic transaminase determinations, as well as an examination of the urine for bile, should be carried out prior to initiating therapy in order to obtain base-line values. These tests should then be repeated at frequent intervals during therapy. The physician should realize that, while liver function tests are helpful, hepatic damage may occur with explosive suddenness. Hence, close clinical observation, with daily examination for liver enlargement or tenderness and jaundice, is imperative.

Since the drug may cause retention of uric acid in occasional patients, routine blood uric acid determinations may also be indicated; in several instances, an acute attack of gout has occurred during or after the period of pyrazinamide administration.

Relatively minor and infrequent side-effects to pyrazinamide include anorexia, gastrointestinal disturbances, joint pains, malaise, nervousness, dysuria, and mild febrile reactions. These effects seldom require discontinuance of therapy.

Dosage

Pyrazinamide is administered orally. The suggested total daily dose, given in three or four divided doses, is 35 mg. per kilogram of body weight. Although some authorities advocate larger amounts (40 to 50 mg. per kilogram), it is generally agreed that the maximum daily dose, regardless of weight of the patient, should not exceed 3 Gm. When used to cover the surgical management of tuberculosis, therapy with this drug should be started one to two weeks before operation and continued through the operative period and for postoperative periods ranging from two weeks to two months.

Preparations: tablets 500 mg.
Merck Sharp & Dohme, Division of Merck & Co., Inc., cooperated by furnishing scientific data to aid in the evaluation of pyrazinamide.

J. Am. Med. Assoc. **170**:133/195 (May 9) 1959.

Preparations

Tablets Pyrazinamide 0.5 Gm.

Safflower Oil — Saff®

Safflower Oil (Saff) is an oily liquid extracted from the seeds of the safflower, Carthamus tinctorius. Safflower oil contains 74.5 percent linoleic acid and 6.6 percent saturated fatty acids.

Actions and Uses

Safflower oil is a natural substance rich in linoleic acid, an essential unsaturated fatty acid. When given in sufficient quantities to subjects with hypercholesteremia, certain unsaturated fatty acids (including those in corn oil and cottonseed oil) have been reported to lower serum cholesterol levels. This effect is variable and is not readily discernible in subjects with normal or near normal cholesterol levels. Safflower oil does not lower serum cholesterol levels to any appreciable extent unless it is substituted for saturated fatty acids already in the diet. For maximal lowering effects, it is necessary to achieve a certain ratio of food fats; this ratio should be approximately one part saturated fatty acid to three parts unsaturated fatty acids. This means that, for an appreciable effect, large amounts of unsaturated fatty acids such as those in safflower oil must be given while the intake of ordinary dietary fat is drastically reduced.

Safflower oil was introduced in 1957 and is proposed for clinical use in patients with hypercholesteremia with a family history of heart disease, in patients who have suffered myocardial infarction, and in those displaying evidence of coronary insufficiency. The rationale for such use stems from the statistical relationship that is commonly supposed to exist between elevated blood cholesterol levels and the frequency of atherosclerosis and its clinical complications. The fact that there is a significant statistical relationship between two variables does not prove that one causes the other. Nevertheless, it seems reasonable to postulate that sustained reduction in blood cholesterol levels, for which safflower oil is proposed, may be desirable. It remains to be shown, however, that safflower oil or any other cholesterol level-lowering agent has any effect, good or bad, in terms of the over-all physical status of the patient. Its clinical use must therefore be considered experimental.

In contemplating the use of safflower oil, it should be borne in mind that the proposed daily dose provides about 450 calories. If taken without a corresponding reduction in regular dietary calorie intake, weight gain may be expected. This is undesirable, since obesity in itself is commonly associated with elevated blood cholesterol levels. In fact, hypercholesteremia may often be improved simply by a program of weight reduction. For these reasons, special care should be given to the administration of safflower oil to obese patients.

Except for a slight tendency to produce diarrhea, safflower oil has been notably free of side-effects. Like other fats, it is a cholecystagogue and should be used cautiously in patients suffering from gallbladder disease.

Dosage

Safflower oil is administered orally. The proposed daily dose is approximately 75 cc. of a 65 percent emulsion given in divided doses. To have any effect, therapy with safflower oil must be accompanied by a simultaneous reduction in the intake of animal fats and hydrogenated vegetable oils.

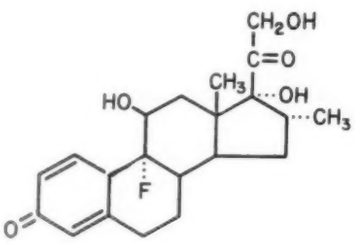
Preparations: emulsion (oral) 65%.
Abbott Laboratories cooperated by furnishing scientific data to aid in the evaluation of safflower oil.
J. Am. Med. Assoc. 169:117/2019 **(Apr. 25) 1959.**

Preparations

Emulsion, Oral, Safflower Oil (Saff) 65 percent; pint bottles.

Triamcinolone Acetonide — Kenalog® Acetonide

TRIAMCINOLONE ACETONIDE (Kenalog) is 9α-flouro-16α, 17α-isopropylidenedioxy-Δ¹-hydrocortisone.—The structural formula of triamcinolone acetonide may be represented as follows:



Actions and Uses

Triamcinolone acetonide, a ketal derivative of triamcinolone, is a highly potent synthetic glucocorticoid which was introduced in 1958 for topical use in the treatment of certain acute or chronic dermatoses. It is effective in much smaller doses than those required with hydrocortisone acetate and shares the same relative freedom from untoward local and systemic effects. The drug is useful for the control of many common dermatoses, allergic and inflammatory, especially those associated with pruritus. Among these are atopic and contact dermatitis, neurodermatitis, seborrheic dermatitis, nummular eczema, eczematous dermatitis, exfoliative dermatitis, anogenital pruritus, and pruritus with lichenification. The drug may also be of value in relieving itching and burning associated with insect bites. Although it has occasionally proved beneficial in the management of eczematized psoriatic lesions (e.g., intertriginous psoriasis), the evidence to date does not suggest any consistent effect in chronic lichenified psoriatic lesions.

With the usual therapeutic doses systemic steroid effects have not been observed. Local irritation has rarely occurred, and, when it has, it may have been due to the vehicle in which it was incorporated rather than to triamcinolone acetonide per se. As with other steroid compounds, the drug should not be applied to infected areas of skin unless appropriate topical or systemic antibiotics are used concomitantly.

Dosage

Triamcinolone acetonide, in concentrations of 0.1 percent, is applied topically to the affected areas two or three times daily.

Preparations: cream 0.1%; lotion 0.1%; ointment 0.1%.
E. R. Squibb & Sons, Division of Olin Mathieson Chemical Corporation, cooperated by furnishing scientific data to aid in the evaluation of triamcinolone acetonide.
J. Am. Med. Assoc. 170:132/194 **(May 9) 1959.**

Preparations

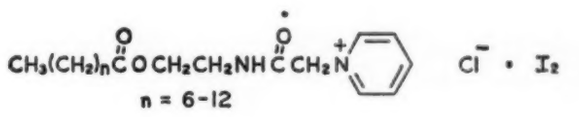
Cream Triamcinolone (Kenalog) Acetonide 0.1 percent; 5 and 15 Gm. tubes.

Lotion Triamcinolone (Kenalog) Acetonide 0.1 percent; 15 ml. plastic bottles.

Ointment Triamcinolone (Kenalog) Acetonide 0.1 percent; 5 and 15 Gm. tubes.

Undecoylium Chloride-Iodine — Virac®

UNDECOYLIUM CHLORIDE-IODINE (Virac) is a complex of iodine with the quaternary compound, acylcolaminoformylmethylpyridium chloride, the acyl group of which is a mixture containing 8 to 14 carbon atoms but principally a 10 to 11 carbon chain. The structural formula of undecoylium chloride-iodine may be represented as follows:



Actions and Uses

Undecoylium chloride-iodine, a complex of iodine and a cationic quaternary detergent, was introduced commercially in 1957 for topical use as a germicidal agent. Although the detergent itself has some antiseptic properties, the antimicrobial activity of the complex is derived almost wholly from the elemental iodine which is slowly released upon contact with skin and mucous membranes. The wetting action of the detergent does, however, facilitate contact of the iodine with surface areas. Since the iodine complex is water-soluble, it does not precipitate with tissue proteins as do iodine tinctures.

Undecoylium chloride-iodine is used for the prophylaxis and treatment of surface infections due to organisms susceptible to the germicidal action of iodine. However, it cannot be used in place of good surgical judgment in the management of puncture wounds or other wounds containing devitalized tissue. To date, it has been employed for preoperative and postoperative disinfection of the skin, perineum, and genital tract, for the treatment of contaminated wounds and cutaneous bacterial infections, as a douche for the control of vaginal trichomoniasis and moniliasis, and for the treatment of fungus infections of the scalp and feet. It is of the same order of effectiveness as other preparations containing iodine. In contrast to tinctures or solutions of elemental iodine, however, the complex does not cause stinging or irritation to the skin or mucous membranes. In addition, it does not stain skin or clothing. The sensitizing potential of undecoylium chloride-iodine is not known, but, on the basis of experience to date, it appears to be quite low. This possibility should be considered in patients with known sensitivity to iodine.

Dosage

Undecoylium chloride-iodine is applied topically as needed, generally as an aqueous solution containing 0.2 percent available iodine. For preoperative disinfection of the skin, more concentrated solutions may be used. Because the complex is detergent, it may be used alone as a shampoo for the treatment of scalp infections.

Preparations: solutions (topical) containing 0.2, 0.6, 0.8, and 3.2% available elemental iodine.
Ruson Laboratories cooperated by furnishing scientific data to aid in the evaluation of undecoylium chloride-iodine.
J. Am. Med. Assoc. 170:134/196 **(May 9) 1959.**

Preparations

Solution Undecoylium Chloride-Iodine (Virac) 0.2, 0.6, 0.8, and 3.2 percent available elemental iodine.

POSITIONS

in hospital pharmacy

PERSONNEL PLACEMENT SERVICE

The Personnel Placement Service is operated without charge for the benefit of hospitals and pharmacist members of the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. The ultimate purpose is the improvement of pharmaceutical services in hospitals, by more adequately fulfilling hospital pharmacy personnel needs and by locating positions which provide challenging opportunities for pharmacists who have indicated an interest in a hospital career.

By participating in the service, the hospital indicates a desire to achieve a pharmaceutical service which meets the *Minimum Standard for Pharmacies in Hospitals.* A description of the position should be submitted to the Division of Hospital Pharmacy on the forms provided. The hospital will receive applications directly from the applicant. The hospital agrees to reply to each application received and to notify the Division of Hospital Pharmacy when the position is filled.

The pharmacist, by participating, agrees to submit a Personnel Placement Service Information Form to the Division of Hospital Pharmacy. The applicant will then be notified of openings listed with the Service as they become available and can negotiate directly with the hospital if he is interested. It is agreed that the Division of Hospital Pharmacy will be notified as soon as a position is accepted.

A listing of positions open and wanted will be made regularly in the AMERICAN JOURNAL OF HOSPITAL PHARMACY without charge. Neither the name of the hospital offering the position nor the name of the applicant will be listed, except by code. All inquiries should be directed as shown below, including the code number.

Address all inquiries to

Division of Hospital Pharmacy
2215 Constitution Avenue, N. W.
Washington, 7, D. C.

positions open

CHIEF PHARMACIST—70 bed general hospital, located in North Carolina. Responsible for establishing a pharmacy department and assisting in the purchasing department. Generous benefits. PO-135

CHIEF PHARMACIST—150 bed general hospital, located in New Mexico. To assume complete charge of purchasing and distributing drugs. PO-134

CHIEF PHARMACIST—96 bed general hospital, located in Montana. Responsible for the procurement, dispensing, control and in-service education program concerning drugs. Generous benefits. PO-133

CHIEF PHARMACIST—100 bed general hospital to assume complete responsibility of purchasing and issuing drugs. Generous benefits. Registration in State of Washington required. PO-132

STAFF PHARMACIST—75 bed general, private hospital located in Indiana. State registration required. Male or female. PO-131

STAFF PHARMACISTS—300 bed general hospital. Inpatient orders - no bulk compounding. Must be eligible for Ill. registration. Forty-four hour week, 2 weeks' vacation. PO-130

CHIEF PHARMACIST—132 bed general hospital located in Ill. Desire applicant with 2 years' experience or 1 year internship. Three weeks' vacation; 40 hour week, 1 week sick leave, Social Security, group hospitalization and retirement plan. Duties as follows: (1) maintain efficient operation of the department; (2) act as pharmaceutical consultant for the medical staff; (3) maintain adequate records and charging system; (4) dispense all drugs, chemicals and pharmaceutical preparations; (5) maintain all facilities of the department; (6) provide emergency service; (7) be responsible for implementing decisions and policies of the Pharmacy Committee and (8) provide a department which will meet the requirements of the Joint Commission on Accreditation of Hospitals, as well as th Minimum Standard established by the ASHP. PO-129

ASST. CHIEF PHARMACIST—325 bed hospital; 40-hour week; 4 weeks' vacation; Must be eligible for registration in Pa. PO-128

CHIEF PHARMACIST—185 bed private nonprofit hospital located in Va. Prefer applicant with hospital pharmacy internship and 1 year's experience. PO-126

STAFF PHARMACIST—1,000 bed general hospital located in Tex. Applicants should be interested in manufacture of pharmaceutical preparations, research and development of new products, sterile solution manufacture, etc. 40-hour week; 1 month vacation; free medical care and other benefits. PO-125

STAFF PHARMACIST—450 bed general hospital located in Ohio. PO-124

ASST. CHIEF PHARMACIST—3,300 bed psychiatric hospital. To assist in the reorganization of the department. Eligible for registration in Ohio. Two years' experience preferred. PO-123

CHIEF PHARMACIST—60 bed mission hospital operated by Presbyterian National Missions; extensive outpatient department; on Navajo Indian Reservation near Gallup, N.M. Qualified to register in Ariz.; single man or woman, challenged by service rather than benefits. PO-122

SENIOR PHARMACIST—325 - expanding to 500 - bed university hospital. Requirements: B.S., registration in Calif., hospital pharmacy internship, supervisory experience. Forty-hour week, 3 weeks' vacation. PO-119

STAFF PHARMACIST—250 bed hospital. Ohio registration, but experience not necessary. Forty-hour week, 2 weeks' vacation. Scheduled salary increases. PO-118

STAFF PHARMACIST—1,000 bed general hospital. Eligible for registration in Ohio. Large O.P.D. Clinic. B.S. required. Forty-hour week, 2 weeks' vacation. PO-117

STAFF PHARMACIST—150 bed general hospital. Only female considered. Must be eligible for Ill. registration. Hospital experience desirable, but not necessary. Forty-hour week, 2 weeks' vacation. PO-116

ASST. CHIEF PHARMACIST—425 bed general hospital; duties include dispensing and supervision of special projects. Prefer male applicant with internship in hospital pharmacy. Unique opportunity to obtain experience. PO-115

CHIEF PHARMACIST—150 bed general hospital. To assume complete responsibility for the pharmacy department. Three weeks' vacation; discount on meals and hospitalization. PO-114

STAFF PHARMACIST—300 bed, short term general hospital. Pharmacy encompasses Central Supply, Oxygen and Inhalation Therapy and Orthopedic equipment, etc. Plans to expand two additional floors with 150 more beds underway. Applicant must be eligible for registration in N.C. Benefits include 2 weeks' vacation, sick leave, group life term insurance, retirement program. Forty-four hour week. PO-113

CHIEF PHARMACIST—340 bed general hospital in South; affiliated with medical school; outpatient clinic and hospital pharmacy internship program. PO-112

STAFF PHARMACISTS—Two—Eligible for licensure in West Va. and Ky. PO-111

STAFF PHARMACIST—320 bed general hospital. Must be eligible for State of Wash. license. Experience in hospital pharmacy desirable. Forty-hour week, 2 weeks' vacation and other benefits. PO-110

CHIEF PHARMACIST—244 bed hospital. Calif. registration required. Complete charge of pharmacy including all purchasing. Forty-hour week, 2 weeks' vacation. PO-106

STAFF PHARMACIST—215 bed general hospital expanding to 35 more beds. N.Y. registration required as well as hospital experience. Forty-hour week, 2 weeks' vacation. PO-104

CHIEF PHARMACIST—73 bed general hospital. Complete responsibility of Pharmacy Dept. Forty-four hour week, 2 weeks' vacation. PO-102

ASST. CHIEF PHARMACIST—152 bed general hospital expanding to 180 beds. Registration in Neb. required. Forty-hour week, 2 weeks' vacation. PO-101

STAFF PHARMACIST—400 bed general hospital located in Iowa. Forty-hour week, 2 weeks' vacation. PO-99

CHIEF PHARMACIST—425 bed hospital. Male preferred. Mo. registration required. Will train good applicant. Forty-hour week. PO-98

STAFF PHARMACIST—400 bed general hospital. Eligible registration in Fla. Forty-hour week. PO-96

STAFF PHARMACIST—500 bed general hospital located in Okla. B.S. required. Forty-hour week. PO-95

ASST. CHIEF PHARMACIST—315 bed general hospital. Registration in Iowa required. Experience desirable. Forty-hour week, 2 weeks' vacation. PO-92

STAFF PHARMACIST—400 bed general hospital. Internship in hospital pharmacy preferred. Eligible for Tex. registration. Forty-hour week; 2 weeks' vacation. PO-90

STAFF PHARMACIST—295 bed hospital expanding to 500 in future. Eligible for registration in Mich. Experience in hospital pharmacy and manufacturing preferred. Forty-hour week, 2 weeks' vacation. PO-86

STAFF PHARMACIST—316 bed general hospital. Eligible registration in Minn. Some manufacturing. Forty-hour week; 2 weeks' vacation and other benefits. PO-81

ASST. CHIEF PHARMACIST—237 bed general hospital in West Va. Female desired. Forty-four hour week, 2 weeks' vacation. PO-77

STAFF PHARMACIST—335 bed hospital located in Fla. Duties include responsibilities in outpatient department and parenteral solution room. Forty-hour week, 2 weeks' vacation and 1 meal daily. PO-75

CHIEF PHARMACIST—265 bed general hospital. Varied duties including teaching if interested. Forty-hour week, 2 weeks' vacation. PO-74

ASST. CHIEF PHARMACIST—313 bed general hospital. Eligible Ky. registration. Forty-hour week, 2 weeks' vacation. PO-73

CHIEF PHARMACIST—325 bed general hospital. Eligible for registration N.Y. Hospital experience desirable. Forty-hour week, 2 weeks' vacation. PO-70

STAFF PHARMACIST—325 bed research hospital. Minimum 2 years' experience, preferably in hospital pharmacy. N.Y. registration required. Duties includes manufacturing sterile solutions and assisting in product development. Research work beyond 40-hour week available at hourly rate. PO-61

CHIEF PHARMACIST—88 bed hospital located in Pa. Planning expansion to 125 beds for general patients and 40 beds for chronic patients. Possibility for pharmacist to serve as Asst. Adm. in charge of Purchasing, Central Supply, and Store Room. Forty-hour week, 2-4 weeks' vacation. Young man preferred. PO-59

ASST. CHIEF PHARMACIST—Large voluntary hospital located in Brooklyn; N.Y. registration required. Supervisory ability needed. Thirty-five hour week, 2 weeks' vacation; 10 days' sick leave; 9 holidays. PO-51

STAFF PHARMACIST—460 bed general hospital in Mass. Forty-hour week, 2 weeks' vacation, other benefits. PO-40

ASST. CHIEF PHARMACIST—310 bed general hospital located in Va. Forty-hour week, 2 weeks' vacation, 3 weeks' sick leave, 6 holidays. Also STAFF PHARMACIST in same hospital. Experience preferred; 40-hour week, 2 weeks' vacation. PO-35

STAFF PHARMACIST—550 bed general hospital located in Ohio. Forty-hour week; 2 weeks' vacation. PO-34

CHIEF PHARMACIST—350 bed hospital. Must be eligible for licensure in N.J.; interest in manufacturing; 44-hour week, 2 weeks' vacation. PO-6

positions wanted

PHARMACIST—Butler University graduate with Ph.C. degree; registered in Ill., Ky., Ind., Ore.; prefers to locate in Midwest. PW-173

PHARMACIST—Graduate Philadelphia College of Pharmacy and Science 1959; 22 months' hospital pharmacy experience; registered in Pa.; desires position in the East. PW-172

STAFF PHARMACIST—Female. 1957 graduate of the University of Buffalo College of Pharmacy. Registered in New York State. Prefers to locate in the East. PW-171

STAFF PHARMACIST—Graduate Columbia University College of Pharmacy, 1958. One year's experience in hospital pharmacy. Registered in New York State, desires to locate in Michigan. PW-170

CHIEF PHARMACIST OR ASST. CHIEF PHARMACIST—Graduate University of Pittsburgh College of Pharmacy, 1956. Registered in Ohio and Pennsylvania. Staff pharmacist experience in making sterile solutions, bulk compounding, student nurse instruction, formulary development and purchasing. One year's experience as chief pharmacist with supervisory responsibilities. Available within 30 days and will locate in any section of the United States. PW-169

PHARMACIST—Registered in Iowa and South Dakota. Prefers to locate in Michigan, Colorado or Arizona. Management experience. PW-167

PHARMACIST—Female. Graduate of the Univeristy of Idaho, 1954. Registered in Illinois. Hospital experience. Prefers Chicago area. PW-166

PHARMACIST—Graduate of Long Island University and the University of Louisville. Prefers position in Kentucky or Virginia area. PW-165

CHIEF OR ASST. CHIEF PHARMACIST—Female. B.S. and M.S. Purdue University. Ten years' hospital pharmacy experience. Registered in Indiana and Kentucky. PW-164

STAFF PHARMACIST—Young female pharmacist from Taiwan would appreciate position in U.S. teaching hospital with opportunity to learn more about hospital pharmacy. Has experience as manufacturing pharmacist at National Taiwan University Hospital. PW-163

STAFF OR ASST. CHIEF PHARMACIST—Male. Served hospital pharmacy internship. One year's additional experience. Registered in Minn. and Wash. Prefers locate West. PW-162

PHARMACIST—Male. Registered in La. and Mo. Experienced. Prefers Midwest. PW-161

STAFF PHARMACIST—Female. Prefers location in long term illness-type institution. Registered in Calif. and Ohio. Experienced. PW-160

STAFF PHARMACIST—Male, married. Registered N.Y. and N.J. Prefers New England. PW-157

CHIEF PHARMACIST—Female, single. B.S. Registered R.I. Eight years' hospital pharmacy experience. PW-156

ASST. CHIEF PHARMACIST—Male, single. Registered N.Y. and Vt. Served hospital pharmacy internship; now employed part-time staff pharmacist. Prefers Eastern part of country. Has M.S.; 4 years' hospital pharmacy experience. PW-154

STAFF PHARMACIST—Male, married. B.S. Served hospital pharmacy internship. Registered D.C. PW-152

ASST. PHARMACIST—Male, married. B.S. Served hospital pharmacy internship. Experienced hospital pharmacist, research pharmacist and retail pharmacist. PW-151

CHIEF PHARMACIST—Male, married. B.S. Ten years' hospital experience. Registered Mass., Ill., Mo., Ky., Tenn., and Va. PW-150

PHARMACIST—Male, single B.S. pharmacy, June, 1959. Locate East. PW-149

ASST. CHIEF OR CHIEF PHARMACIST—Single Male. Registered in D.C., Ill., Md., and Pa. Graduate University of Pittsburgh in 1953; experience in research; Prefers North and East. PW-148

CHIEF PHARMACIST—Registered in Mo. and Ill. Ph.G. degree; 8 years' experience in hospital pharmacy. PW-147

STAFF PHARMACIST—Male, single. Completed military requirements. Hospital pharmacy experience. Prefers East. PW-146

CHIEF PHARMACIST—Registered in N.J. Any location. Six years' experience in hospital pharmacy. PW-145

CHIEF PHARMACIST—Prefers N.Y. or N.J. area. Over 20 years' experience as chief pharmacist and purchasing agent. Graduate St. John's University College of Pharmacy and registered in N.Y. and N.J. PW-144

STAFF PHARMACIST—Female, single. Registered Philippines. M.S. pharmacy, St. Louis College of Pharmacy. Locate any section of country. PW-143

ASST. CHIEF PHARMACIST—Male, married. B.S. pharmacy. Registered N.Y. Hospital and retail experience. Locate N.Y. State. PW-142

CHIEF PHARMACIST—Male, married. B.S. Conn. registration. Five years' hospital pharmacy experience. Prefers Northeast section of country. PW-140

STAFF PHARMACIST—Female, married. Registered Kansas. Four years' hospital pharmacy experience. PW-136

PHARMACIST—Male, married. Registered Mass. D.C. and Md. Will locate any part of U.S. Served hospital pharmacy internship. Over 20 years' hospital pharmacy experience. PW-128

PHARMACIST—Male, single. Registered Conn. and N.J. Five years' hospital pharmacy experience. B.S. Prefers Conn. or Texas. PW-123

ASST. DIRECTOR OR DIRECTOR OF PHARMACY SERVICES—Male, single, B.S. Retail and one year's hospital experience. Registered Ill. PW-119

Journal Binders Available

A loose-leaf binder for the AMERICAN JOURNAL OF HOSPITAL PHARMACY is now available from The Hamilton Press, Hamilton, Illinois. The new binder has been designed for THE JOURNAL and will hold the twelve issues satisfactorily. The binder is brown in color and "American Journal of Hospital Pharmacy" is embossed on it in gold. The binder is 9 by 12¼ inches with the spine measuring 4 inches.

The cost of the binder is four dollars ($4.00) each and orders may be directed to The Hamilton Press, Hamilton, Illinois.

A few copies of the loose-leaf binders for THE BULLETIN OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, which was published on a bi-monthly basis from 1946 through 1957, are available at two dollars ($2.00) each. On ordering binders, please indicate clearly whether you want binders for THE JOURNAL (twelve issues) or THE BULLETIN (six issues).

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